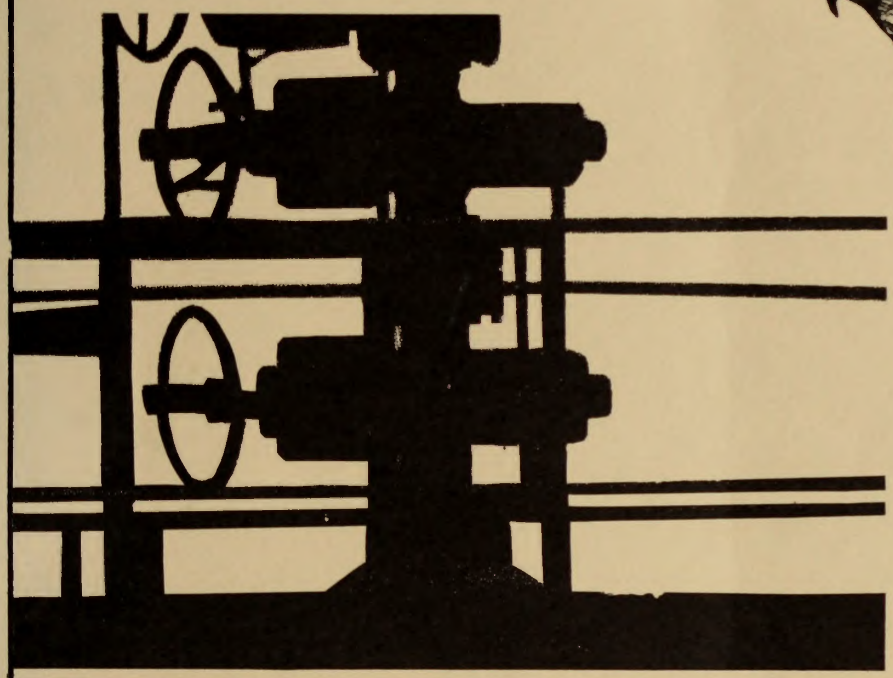
BLM LIBRARY
88013658

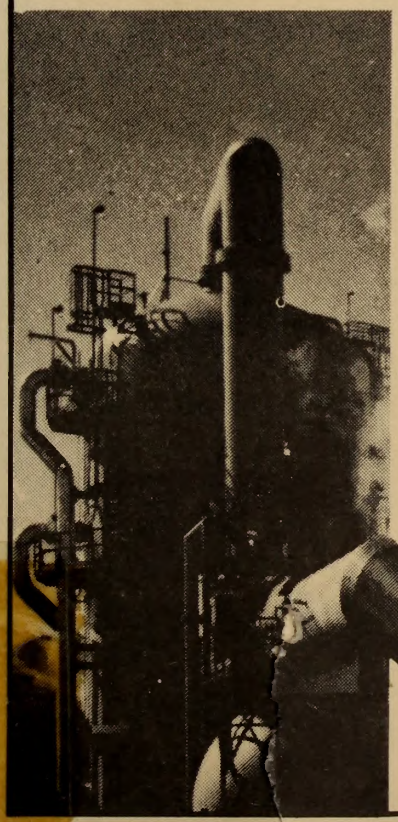
RILEY RIDGE NATURAL GAS PROJECT

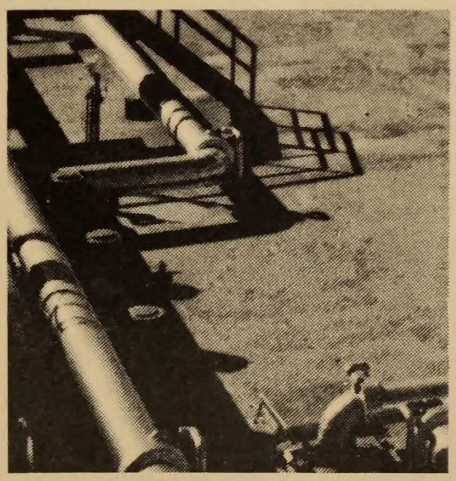
FINAL ENVIRONMENTAL IMPACT STATEMENT

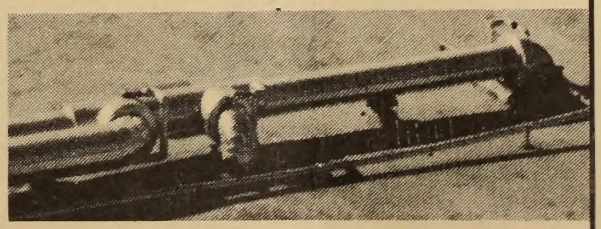
NOVEMBER 1983

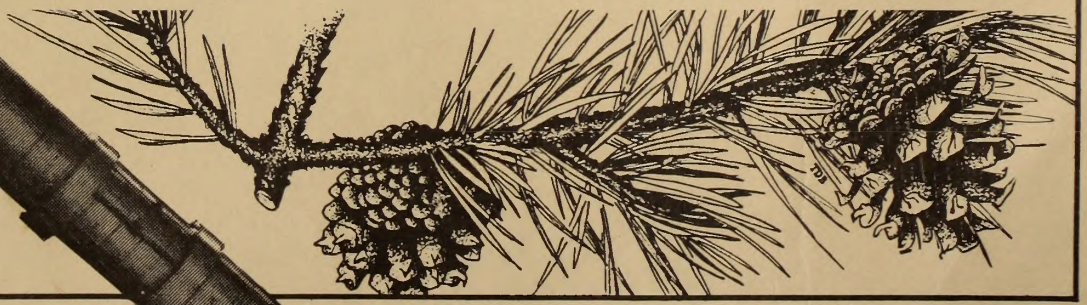
DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT
DEPARTMENT OF AGRICULTURE
FOREST SERVICE











IN REPLY REFER TO:

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Wyoming State Office
P.O. Box 1828
Cheyenne, Wyoming 8200]

Dear Reader:

The final Environmental Impact Statement (EIS) on the Riley Ridge Natural Gas Project is furnished for your information and use. As a supplement to the draft EIS, which was published on May 20, 1983, this volume contains a revised Summary and a revised Comparative Analysis. New material in these two revised sections is highlighted through the use of bold italic print.

This volume also contains the following new material: errata summary which contains necessary corrections and additions to the DEIS resulting from review comments received; comments on the draft EIS received during the public comment period and responses to the comments; Recommendations for Groundwater Monitoring; Air Quality Related Values Action Plan; Fisheries and Surface Water Monitoring Program; Cultural Resources Compliance Guidelines; and three new maps, Map 2-1 Locations of Sensitive Receptors and Populated Areas in Relation to Proposed Sour Gas Pipelines, and Maps S-1 and S-2 Agency Prefered Alternative Location maps.

Errata summaries for the Air Resources Technical Report and the Wildlife and Fisheries Technical Report were also prepared.

Because this is an abbreviated final, the entire document to be considered for filing purposes and in the decision making process consists of this volume and the draft EIS. Please refer to the draft for more detailed analysis and descriptions of the proposed action and alternatives.

Copies of the draft EIS, final EIS and Errata Summaries for the technical reports may be obtained upon request from Mr. Richard Traylor, Bureau of Land Management, Division of EIS Servics (D-490), 555 Zang Street, 1st Floor East, Denver, Colorado 80228.

The final EIS is not the decision document. The decision on the requested rights-of-way will be based upon the analysis in the final EIS, public concerns and comments, and other multiple-use resource objectives or programs that apply to the project.

Please send comments on the content of the final EIS to:

Mr. Maxwell T. Lieurance, State Director
Bureau of Land Management
Wyoming State Office
2515 Warren Avenue
Cheyenne, Wyoming 82001

Written comments will be considered in the decision if the comments are received by December 30, 1983.

A Record of Decision that outlines the decision and the rationale will be prepared and distributed through the Wyoming State Office as soon as the decision is reached, presently scheduled for early February.

Sincerely,

T. C. Roederer

For J.S. Tixler
Regional Forester
Intermountain Region
USDA Forest Service

Maxwell T. Lieurance

Maxwell T. Lieurance
BLM, Wyoming
State Director

88013658

FILE
.2
FES
TD
195
.G3
R54
19836

DEPARTMENT OF THE INTERIOR

AND DEPARTMENT OF AGRICULTURE

Bureau of Land Management
Library
Bldg. 50, Denver Federal Center
Denver, CO 80225

FINAL ENVIRONMENTAL IMPACT STATEMENT ON THE RILEY RIDGE NATURAL GAS PROJECT SUBLETTE, LINCOLN, AND SWEETWATER COUNTIES, WYOMING

Prepared by

BUREAU OF LAND MANAGEMENT, FOREST SERVICE, AND ENVIRONMENTAL RESEARCH & TECHNOLOGY, INC.

November 1983

Director, Wyoming State Office, Bureau of Land Management

for Regional Forester, Intermountain Region, Forest Service

COVER SHEET

Riley Ridge Natural Gas Project Environmental Impact Statement

( ) DRAFT (X) FINAL

Joint Lead Agencies	U.S. Department of the Interior Bureau of Land Management
	U.S. Department of Agriculture Forest Service
Cooperating Agencies	U.S. Department of the Interior Fish and Wildlife Service
	U.S. Department of Energy Federal Energy Regulatory Commission
	U.S. Department of the Army, Corps of Engineers
	U.S. Environmental Protection Agency
Counties That Could Be Directly Affected	Sublette, Lincoln, and Sweetwater Counties, Wyoming

Abstract

American Quasar Petroleum Company; Exxon Company, USA; Northwest Pipeline Corporation; Mobil Oil Corporation; and Williams Exploration Company propose to develop, produce, treat, and transport natural gas from a new deep gas well field in western Wyoming.

This Draft Environmental Impact Statement analyzes the environmental effects of the proposed well field development and the construction, operation, and abandonment of four low-Btu natural gas treatment plants in Sublette, Lincoln, and Sweetwater Counties, Wyoming. The facilities are designed to process a total of 2.8 billion cubic feet per day of natural gas.

This EIS analyzes the impacts of the Proposed Action and three siting alternatives: the Buckhorn, Shute Creek, and Northern Alternatives. The No Action Alternative is also analyzed. Individual component alternatives are analyzed for sulfur transport, power supply, and employee housing.

Based on the issues and concerns identified during the scoping process, the EIS focuses on the impacts to socioeconomics, wildlife, health and safety, and air quality. Key issues include effects to communities and people in the study area; effects to wildlife and wildlife habitat; effects to human health and safety from the release of hydrogen sulfide gas; and potential reductions in air quality and visibility.

The BLM and FS have jointly identified the Agency Preferred Alternative to be a *modified* Shute Creek Alternative. Plant site locations would be Craven Creek, Shute Creek, and East Dry Basin.

EIS Contact

Mr. Maxwell T. Lieurance
BLM Wyoming State Director
Wyoming State Office
2515 Warren Avenue
Cheyenne, WY 82001
(307) 772-2326

Date EIS Made Available to EPA and the Public
Draft: May 20, 1983
Final: November 28, 1983

PREFACE

The purpose of this final environmental impact statement (EIS) is to supplement the draft EIS which was published in May 1983. Reviewed together, the draft and final EISs incorporate the description of the affected environment and analyses of potential environmental consequences resulting from construction, operation, and abandonment of the Riley Ridge Natural Gas Project and its alternatives. This final EIS should not be considered as a complete EIS, nor as a decision document. It contains a revised Summary (Section 1) and Chapter 2, Comparative Analysis of Proposed Action and Alternatives (Section 2). Information presented in these two sections that is different from material presented in the draft EIS is identified by bold italicized print. The Energy portion of Chapter 2 from the draft has not been repeated here.

In addition, the final EIS contains new material. Section 3, the Errata Summary, provides text changes to the draft EIS. Section 4, Consultation and Coordination, contains background information, consultation and coordination processes, and copies of comment letters received during the 60-day public comment period. All comment letters are reprinted verbatim, and responses to individual comments accompany each letter. Responses to comments made during the public hearings are also provided in this section.

The final EIS also contains new appendices which identify material related to the analyses in the draft and final EISs. These appendices include Recommendations for Groundwater Monitoring, Air Quality Related Values Action Plan, Fisheries and Surface Water Monitoring Program, and Cultural Resources Compliance Guidelines.

The Biological Assessment required under Section 7 of the Endangered Species Act is included in the final EIS as Appendix F. It will be submitted to the U.S. Fish and Wildlife Service and the resulting Biological Opinion will be included as part of the final decision-making process.

The EIS has been prepared according to the requirements of the National Environmental Policy Act of 1969 (NEPA) and the Council on Environmental Quality's regulations for implementing NEPA, effective July 30, 1979.

The analyses were based on a proposed schedule of development contained in the draft EIS. When the schedule is finalized, the impacts will be reevaluated to determine if they fall within the parameters discussed in the draft and final EISs. Any major change in project design would require additional environmental analysis.

Technical reports that support the EIS were prepared on the following topics:

- Description of the Proposed Action
- Socioeconomics
- Wildlife and Fisheries
- Health and Safety
- Air Resources
- Soils, Vegetation, and Reclamation
- Cultural Resources

The technical reports can be obtained from the Bureau of Land Management, Division of EIS Services, 555 Zang Street, First Floor East, Denver, Colorado 80228. They are also available for review at BLM offices in Rock Springs, Pinedale, and Kemmerer, Wyoming, and Forest Service offices in Big Piney, Pinedale, and Jackson, Wyoming, and Ogden, Utah.

An Addendum to the Wildlife and Fisheries Technical Report and an Errata Sheet for the Air Resources Technical Report have been prepared and are also available from the BLM at the address noted above.

TABLE OF CONTENTS

Page

SECTION 1, SUMMARY

Introduction 1-1
Areas of Controversy 1-1
Major Impact Conclusions 1-2
Issues to be Resolved 1-4
Agency Preferred Alternative 1-5

SECTION 2, COMPARATIVE ANALYSIS OF PROPOSED ACTION AND ALTERNATIVES

Siting Alternatives 2-1
Differences Among Siting Alternatives 2-6
Component Alternatives 2-13

SECTION 3, ERRATA SUMMARY

Text Revisions 3-2
Text Additions 3-13
Revisions to Tables, Figures, and Maps 3-17

SECTION 4, CONSULTATION AND COORDINATION

Scoping Process 4-1
Draft EIS Consultation and Coordination 4-1
Public Review of Draft EIS 4-2
Comments and Responses 4-3

SECTION 5, APPENDICES

APPENDIX E-1 - RECOMMENDATIONS FOR GROUNDWATER MONITORING 5-1
APPENDIX E-2 - AIR QUALITY RELATED VALUES ACTION PLAN 5-7
APPENDIX E-3 - FISHERIES AND SURFACE WATER MONITORING PROGRAM 5-29
APPENDIX E-4 - CULTURAL RESOURCES COMPLIANCE GUIDELINES 5-37
APPENDIX F - BIOLOGICAL ASSESSMENT 5-43

LIST OF TABLES AND MAPS

Table — Page

2-1 Comparison of Mitigated Significant Impacts for Siting Alternatives 2-2
2-2 Comparison of Mitigated Impacts for the Sulfur Transport Component Alternative 2-14
2-3 Comparison of Mitigated Impacts for the Power Supply Component Alternative 2-15
2-4 Comparison of Mitigated Impacts for the Employee Housing Component Alternative 2-17
4-1 Agencies, Organizations, and Individuals Requested to Formally Review the Draft EIS 4-1
4-2 Draft EIS Public Hearings 4-3
4-3 Letters Requiring Substantive Comments 4-4

Maps

S-1 Preferred Alternative (North) ..... Map Pocket
S-2 Preferred Alternative (South) ..... Map Pocket
2-1 Locations of Sensitive Receptors and Populated Areas in Relation to Proposed Sour Gas Pipelines ..... Map Pocket

SECTION 1

SUMMARY

INTRODUCTION

The Riley Ridge Project is a natural gas development project which includes the construction, operation, and abandonment of a deep gas well field in western Wyoming, gathering lines for the transportation of sour gas within the well field, trunk lines for shipment of sour gas from the well field gathering lines to the treatment plants, the treatment plants, sales gas pipelines for delivery of sales gas to existing gas transmission pipelines, and facilities for the handling and transportation of by-products (sulfur and carbon dioxide) to markets. The project represents three individual projects proposed by:

1) Northwest Pipeline Corporation and Mobil Oil Corporation
2) Exxon Company, U.S.A.
3) American Quasar Petroleum Company and Williams Exploration Company.

Major project actions and components consist of the following:(1) exploration, development, and abandonment of a 159,928-acre, low-Btu gas well field;(2) construction, operation, maintenance, and abandonment of four sour gas treatment plants with a total processing capacity of 2.8 billion cubic feet per day (cfd) and producing 576 million cfd of methane;(3) construction, operation, maintenance, and abandonment of associated rights-of-way for gathering lines, trunk lines, railroads, access roads, transmission lines, and other ancillary facilities; and(4) processing and transportation of products and by-products.

The applicants have applied to the U.S. Department of the Interior (DOI), Bureau of Land Management (BLM) for right-of-way permits to cross federal land managed by the BLM and Forest Service (FS). This environmental impact statement (EIS) was prepared jointly by BLM and FS. The BLM has assumed the administrative lead and is responsible for filing the EIS with the Environmental Protection Agency.

In addition to the proposed project, numerous component alternatives and siting alternatives have been evaluated. These include the sulfur transport alternative, power supply alternative, and employee housing alternative; and the Buckhorn, Shute Creek, and Northern sour gas treatment plant siting alternatives; as well as the No Action Alternative.

AREAS OF CONTROVERSY

Several concerns about the Riley Ridge Project were raised during the public scoping meetings held in Cheyenne, Kemmerer, Pinedale, and Big Piney, Wyoming on November 2, 3, 4, and 5, 1981, respectively, and through the mail-in comments in July of 1982. The results of these comments are summarized in a document entitled *Public Concerns and Scope of EIS,* which is available from BLM Division of EIS Services, 555 Zang Street, First Floor East, Denver, Colorado 80228, and BLM offices in Cheyenne, Kemmerer, Rock Springs, and Pinedale, Wyoming. The most significant issues raised were socioeconomics, wildlife, air quality, and health and safety.

Under socioeconomics, the effects to communities and the people within the study area from project activities (construction personnel, etc.) was identified as a significant issue and concern. The area has experienced boom-type growth in the past from energy development and is thus sensitive to any similar future developments.

Under wildlife, effects to wildlife and wildlife habitat (especially within the well field) are a major concern to the FS, BLM, Fish and Wildlife Service (FWS), Wyoming Department of Game and Fish, and the general public. Hunting is an important recreational activity in Wyoming. The well field lies in an area which is critical range (i.e., wintering areas, calving areas, etc.) for elk, deer, pronghorn (antelope), and moose. Development of all types has reduced the amount of winter range for big game. Feedgrounds have been utilized to compensate for lost habitat; however, the quantity and quality of big game herds has been affected. This well field area encompases one of the last natural wintering areas in the Upper Green River Valley for elk.

Under air quality, concerns were expressed by the BLM, FS, National Park Service, Environmental Protection Agency, and general public. The project area is located in a region of western Wyoming where air quality is good and relatively unaffected by industrial development. The major exception to this is in the trona mining area near Green River, Wyoming. Concerns were generally related to reductions in air quality in national parks and wilderness areas (Class I) and in the general project area (Class II), reductions in visibility in national parks and wilderness

areas, and effects of acid deposition on high mountain lakes in the Bridger Wilderness to the east of the proposed gas treatment plants.

Under health and safety, effects to human health and safety from the release of hydrogen sulfide (H_2S) gas is an issue to the general public and the ***agencies.*** The natural gas, as taken from the wells, contains a small percentage of hydrogen sulfide (H_2S) which is toxic. Potential areas where hazards from H_2S are possible are wells, pipelines, and at the plants. ***Final locations of sour gas pipelines will consider health and safety factors.***

MAJOR IMPACT CONCLUSIONS

Western Wyoming is currently undergoing a change from an area characterized by rangeland and wilderness to one experiencing industrial growth and active exploration and development of oil and gas reserves ***and other energy and non-energy commodities.*** This trend is having many beneficial and adverse effects on the human and natural environments of the area. ***Positive impacts include increased employment and increased local revenue. Revenues directly related to resource extraction associated with the Riley Ridge Project are the state-levied ad valorem and severance taxes and a federally collected royalty. The revenue to Wyoming from the mineral severance tax alone was $138 million in 1981. The result of these revenues has been a substantial increase in the State's general fund and benefits to the entire state and local communities. The responses to Public Hearing comments provide further discussion concerning these revenues.***

As with any project, uncertainties exist relative to the timing of project implementation and ultimate size. For the projects included in the Riley Ridge EIS, there is significant potential for delay in project implementation. Although these delays cannot be quantified at this time, it is very probable that several of the proposed plants and the field development in support of those plants could be delayed for a period of up to five years.

The Riley Ridge EIS Proposed Action is a worst-case analysis for all projects defined by the applicants in their individual rights-of-way applications. If one or more of the proposed plants currently analyzed under the Proposed Action is delayed, the resulting impacts are anticipated to be less than those presented. Since the probable delays cannot be quantified at this time, the reduction of impacts also cannot be quantified.

The major unmitigated environmental impacts of the Riley Ridge Project are detailed in Chapter 4 of ***the Draft*** EIS ***(DEIS). A revised comparative analysis (Section 2) is contained in this final EIS (FEIS). Impacts associated with implementation of the Proposed Action and alternatives considering the committed mitigation measures are compared in this section.*** However, there are several major issues and impacts associated with the Proposed Action which need to be stressed. Major issues and impacts associated with the project are summarized below.

SOCIOECONOMICS

The construction of the Riley Ridge Project would create significant, potentially adverse impacts in the short-term and beneficial impacts in the long-term. The direct employment for nearly 3,000 workers in 1985 would contribute to a strong regional economy in Lincoln, Sublette, and Sweetwater Counties, but place demands on local governments, particularly Sublette County, that would far exceed their current service capacity and fiscal capability. In the long term the revenues accruing to affected jurisdictions could provide substantial local benefits and opportunities for enhancing the quality of life. While these prospects are attractive, the short-term problems could create substantial hardships for newcomers and residents alike, due to crowding and service shortfalls.

WILDLIFE AND FISHERIES

Several aspects of the Riley Ridge Project would result in significant adverse impacts to wildlife within the study area. A serious impact would result from the increase in human population and accompanying human disturbance to wildlife in the form of increased hunting and fishing pressure. Increased game violations, harassment, and road kills would also result from the project. Another significant impact would be the disturbance of critical ranges during their season of use and loss of critical ranges through project construction activities.

The project presents the possibility of adversely affecting streams in the well field area. Increased long-term siltation coupled with increased fishing pressure, altered stream flows, and a few accidental spills could create sufficient stress on the existing fishery to significantly reduce its future value. Special concern is held for the native Colorado River cutthroat trout.

HEALTH AND SAFETY

The probability of a well blowout or a pipeline rupture is critical in determining the effects to humans

from the presence of H_2S gas. Because the gas is extremely toxic, the frequency of an accident and dispersion of the gas is critical. Analysis for the project has indicated that there would be a potential for 2.8 well blowouts associated with drilling and production operation during the lifetime of this project. Individuals within one-half mile of a well blowout could be subjected to lethal levels of at least 1,000 parts/ million H_2S. Individuals within 1 to 2 miles could be subject to significant doses of H_2S, i.e., doses that would cause human discomfort.

Based on the pipeline rupture analysis, it was concluded that in any year there is about a 7 percent chance that ruptures would occur in the gathering system, but there is only about a 1 percent chance that a trunk line would rupture. The size of the ruptured pipeline would determine the potential impact on humans. The rupture of a 4-inch pipeline would not result in lethal H_2S doses to people in towns or traveling established routes, while the rupture of a 12-inch pipeline or an 18 to 26-inch pipeline could cause lethal doses to individuals within 1 to 3 miles, respectively.

Based on modeling results with the implementation of mitigation measures, populated areas (such as Big Piney and LaBarge) and sensitive receptors (such as isolated ranches and industrial sites) in the study area would be at minimum (less than 3 in 100,000) risk of exposure to significant levels of H_2S from a trunk line rupture.

WATER RESOURCES

Impacts to water resources are difficult to assess because of data gaps concerning characteristics of the surface and groundwater systems, the frequency of events (leaks, ruptures, other failures) affecting water resources, and engineering details on the applicant's waste water disposal systems. While quantification is not possible, significant impacts on water resources are expected to occur during the life of the project. In order to reduce potential impacts, mitigation measures have been developed but additional environmental analysis and monitoring will be required. The project will also have to comply with the permit requirements of the State of Wyoming.

AIR QUALITY

While significant air quality impacts ***were predicted*** from the operation of the Riley Ridge Project, ***all companies would be required to comply with the*** Prevention of Significant Deterioration (PSD) Class II increment for sulfur dioxide (SO_2) and the Wyoming Ambient Air Quality Standard (WAAQS) for hydrogen sulfide (H_2S). There would be no exceedances of the PSD Class I standards. Significant odor impacts resulting from releases of small amounts of H_2S would occur near the East Dry Basin, West Dry Basin, Big Mesa, and Buckhorn plant sites but would not affect populated areas.

SOILS AND VEGETATION

The Riley Ridge Project would disturb approximately 12,852 acres of soils and vegetation during construction. Of this, 641 acres would remain in roads and railroads and would not be reclaimed at the end of the project life. In assessing significant impacts, it has been assumed that the Erosion Control, Revegetation, and Reclamation Program would be successfully implemented and that soils would be stabilized within 5 years following construction or abandonment. No significant impacts to soils are anticipated. About 63 acres of riparian vegetation would be disturbed ***by well field access roads and the sulfur loadout during project operation, and this long-term disturbance is considered a significant impact.***

VISUAL RESOURCES

The project as proposed would substantially alter the visual character of much of the project area and contribute to a continued progression from a predominantly natural landscape to one that is man-dominated. Most affected would be the well field and lands crossed by the sulfur pipeline.

CULTURAL RESOURCES

Construction and operation of the Riley Ridge Project would cause both direct and indirect impacts to cultural resources in the study area. A Class III (100 percent) survey of each area to be disturbed will be conducted prior to construction to determine the actual resources present and the potential impacts to those resources. Less than 5 percent of the study area has been previously surveyed.

RECREATION

During the years 1985 and 1986 when the construction work force would be at its peak, the quality of recreation experiences available in the area would be significantly impacted. The long-term prospects, however, would be much more favorable and all affected groups, newcomers, long-time residents, and

temporary visitors, would be able to enjoy the area's many recreation opportunities.

WILDERNESS

Both short-term and long-term significant impacts to wilderness-related values would occur to the following areas: Bridger Wilderness, Scab Creek Instant Study Area, Lake Mountain Wilderness Study Area, and high density use corridors of the Popo Agie Primitive Area and Teton Wilderness. Impacts would be primarily attributed to anticipated increases in visitation. The ability of the wilderness resources to absorb social, physical, and biological impacts would likely exceed carrying capacity threshold levels. Wilderness related values could be significantly impaired by severely diminishing the quality of user experiences through increased visitation. ***Potential impacts to one air quality related value (AQRV), specifically water quality related to acid deposition in high mountain lakes, has been determined to be significant.***

AGRICULTURE/GRAZING

Impacts to agriculture and grazing ***would be*** generally insignificant. Significant impacts due to loss of forage, however, would occur in 5 small grazing allotments during construction. Unquantifiable but significant impacts could also occur to those ranchers using the Slate Creek sheep trail. There would be no impacts to prime farm land.

TIMBER

Impacts to timber would be generally favorable due to project construction of new access roads that would reduce the costs of timber harvesting in otherwise remote and previously inaccessible areas.

TRANSPORTATION

In the summers of 1985 and 1986, construction activities plus anticipated recreational travel would create traffic volumes that would lead to traffic congestion and traffic slowing in and around Kemmerer, Opal, LaBarge, Big Piney, and Marbleton during peak commute hours. While these would not be so severe as to disrupt emergency services (police, fire, and ambulance) they could be annoying to the resident public and perceived as a degradation in the quality of life in the area. These impacts would only be temporary, however. Once construction is completed, traffic volumes due to the proposed project would decrease substantially.

LAND USE

The principal land use conflicts of the proposed project are with the planning objectives of the federal land management agencies ***to locate linear facilities such as transmission lines and pipelines in common corridors.*** Except for conflicts with Sublette County zoning which would probably be dealt with administratively, for many areas affected by the project, existing land use plans encourage the type of development that is proposed.

NOISE

Noise impacts would be localized but significant during construction due to heavy truck traffic. Residences and businesses within one-half mile of U.S. 189, U.S. 30, and S.R. 240 would be most affected.

ISSUES TO BE RESOLVED

Implementation of the proposed project would be dependent upon resolution of issues in three resource areas: socioeconomics, air quality, and water resources. These issues would be resolved in the permitting processes of the Wyoming Industrial Siting Council, the Wyoming Oil and Gas Commission, the Wyoming Department of Environmental Quality, ***and BLM-Minerals Division.*** The issues ***for*** which resolution is expected are discussed below.

SOCIOECONOMICS

The Proposed Action would have significant adverse impacts on housing and local public services. Additional housing units and public services would be needed as a result of the increased population to the study area. A schedule and definite plan for meeting these project-generated needs would be required by the Wyoming Industrial Siting Council as part of its permit process. Permission to proceed with project construction would be dependent upon acceptance of a required mitigation plan.

AIR QUALITY

The potential problem for the Proposed Action associated with Quasar's predicted violation of the SO_2 24-hour average PSD Class II increment (based on use of off-site meteorological data) would have to be resolved during the PSD permitting process. Resolution of this problem is potentially a two step

process. The first step would be to remodel Quasar's SO_2 impacts with on-site meteorological data. If violations are still predicted, the second step would be for Quasar to install additional in-plant sulfur controls or other options they may develop.

Quasar's plant for the Proposed Action and all alternatives shows predicted violations of the Wyoming half-hour H_2S standards. Resolution of this problem is identical to that for SO_2.

The Exxon and Northwest plants ***will undergo similar review as part of the PSD permitting process. On-site meteorological data would be used by the Wyoming Department of Environmental Quality to verify the results found in this EIS (e.g., no significant impact). If the on-site data showed problems of compliance with PSD increments or air quality standards, that issue would have to be resolved by installation of additional plant emission controls or other appropriate modifications.***

Resolution of these issues must be achieved for granting of the PSD permit and approval to begin project construction.

WATER RESOURCES

The effects on groundwater of deep well reinjection of waste water from the sour gas treatment plants and well field dehydrators have not been fully analyzed due to lack of information on the applicant's injection engineering plans and specific water resources data. Prior to allowing this activity on or off the proposed plant sites, the BLM will require further analysis of impacts. In addition, the Wyoming Oil and Gas Commission, Wyoming Department of Environmental Quality, and BLM-Minerals Division must review and approve the applicants' disposal plans. The necessary permits or approvals would be required before the applicants could begin drilling new reinjection wells or injecting in old oil or gas wells.

AGENCY PREFERRED ALTERNATIVE

Based upon the analysis of environmental consequences described in the Riley Ridge Natural Gas Project Draft Environmental Impact Statement (DEIS) and in consideration of all public, state and federal agency, and industry scoping, hearing, and written comments received, the BLM and FS have jointly identified the Agency Preferred Alternative to be a modification of the Shute Creek Alternative. The Shute Creek Alternative is modified to the extent that the East Dry Basin plant site is preferred to the Buckhorn plant site. Therefore, plant sites would be Craven Creek, Shute Creek, and East Dry Basin.

The Agency Preferred Alternative was selected on the basis of the comparative analysis presented in Section 2 of the FEIS and the ultimate impacts which would result from the implementation of this Alternative with all applicable mitigation. The Agency Preferred Alternative would have fewer overall negative impacts to resources than the other alternatives considered. Implementation of the Agency Preferred Alternative would be subject to the mitigation measures identified in the Committed Measures section in Chapter 4 of the DEIS; Appendix B, Required Federal Measures and Applicants' Standard Operating Procedures; and Appendix C.6, Sour Gas Trunk Line Mitigation Measures, as well as mitigation added or changed in the Errata Summary section of the Final EIS and any other measure subsequently identified and deemed necessary by the Authorizing Officer.

As a result of any applicant delays in their project plans, the cumulative impacts associated with this project would be reevaluated prior to granting any of the requested Federal actions to determine if they are still within the parameters considered in the EIS.

The Agency Preferred Alternative is the first step in the decision-making process based on the comparative analysis and mitigation presented. It is meant to solicit public opinion which will be considered prior to a final decision being made. The final decision will be published in a joint Record of Decision.

A description of the Riley Ridge Project components and associated actions as they would be permitted for each applicant follows:

WELL FIELD

Before any drilling activity occurs within the well field area, each lease operator would be required to submit a federal application for permit to drill (APD). The process for issuing APDs is described in the DEIS on pages 1-3 and 1-12. Approval of an APD would include site-specific application of the above referenced mitigation measures to well siting, access roads, pipelines, powerlines, and other associated facilities. A description of the lease operator activities that would require issuance of an APD by the BLM is summarized by applicant in the DEIS (pages 1-35 and 1-36).

TREATMENT PLANS

The potential problem of Quasar's predicted violation of the SO_2 24-hour average PSD Class II increment (based on use of off-site meteorological data)

would have to be resolved during the PSD permitting process. Resolution of this problem is potentially a two-step process. The first step would be to remodel Quasar's SO_2 impacts with on-site meteorological data. (This would simultaneously resolve the problem of results based on off-site meteorological data.) If violations are still predicted, the second step would be for Quasar to install additional in-plant sulfur controls or other options they may develop. Quasar's plant also shows predicted violations of the Wyoming half-hour H_2S standards. Resolution of this problem would be identical to that for SO_2.

The Exxon and Northwest plants would have to resolve the problem of results based on off-site meteorological data. In their respective PSD permit applications to the Wyoming Department of Environmental Quality, use of on-site meteorological data in the modeling would resolve current uncertainties.

Resolution of these issues must be achieved before granting the PSD permits and approval to begin project construction.

Quasar

The East Dry Basin plant site is preferred. This site is comprised of 640 acres in Sections 34 and 35 of T.29N., R.112 W. and Section 4 of T.28N., R.112W., Sublette County, Wyoming. See Map S-1 for location.

Northwest

The Craven Creek plant site is preferred. This site is comprised of 640 acres in the E½ of Section 29 and W½ of Section 28 in T.22N., R.113W., Lincoln County, Wyoming. See Map S-2 for location.

Exxon

The Shute Creek plant site is preferred. This site is comprised of 640 acres in Section 14 of T.22N., R.112W., Lincoln County, Wyoming. See Map S-2 for location.

Management considerations paramount to the selection of the treatment plant locations were as follows:

1. *Socioeconomics*

   Because Lincoln County is stronger in terms of fiscal condition than Sublette County, it would be better prepared from the standpoint of finances and services to deal with the growth that would be associated with project development.

   The alternative was preferred because of the overwhelming support by county (Lincoln, Sweetwater, and Sublette) and local (Kemmerer, Diamondville, LaBarge, Big Piney, Pinedale, and Rock Springs) governments, and the general public for the identification of an alternative that would locate the treatment plants to provide the most balanced distribution of growth between Lincoln and Sublette Counties.

2. *Wildlife and Fisheries*

   Human population-related impacts, such as legal and illegal hunting and fishing, wildlife harassment, road kills, and unintentional disturbance, would be less because of the more even distribution of increased population in the study area and the smallest population increase in the Big Piney area, near critical big game range and sensitive trout fisheries. This alternative would result in increased impacts to deer and antelope critical winter range at East Dry Basin. This tradeoff is preferred when compared to having a sour gas pipeline, sulfur pipeline, and power transmission line crossing the Green River which could significantly affect fisheries in the event of a rupture, and waterfowl, eagles, whooping crane, etc., through collision with the powerline.

3. *Air Quality*

   Combined SO_2 impacts would be the least for this alternative. Odor impacts would be next to the lowest. Some residences may experience odor-causing levels (6.5 to 10 parts/million) of H_2S within a 4-mile radius of the East Dry Basin plant. The Buckhorn plant site is the only alternative site to offer less impact from odor. However, if a market for CO_2 is found, no odor problem should exist since 90 percent of the problem would be due to the venting of CO_2, which contains approximately 10 parts/million H_2S.

4. *Recreation*

   Through the more even distribution of human population growth, recreation use patterns would create less impact.

5. *Health and Safety*

   Since potential release of H_2S is proportional to the length of the sour gas trunk lines, this alternative would pose the highest potential impact. However, by applying the mitigation

specified in Mitigation Measure H-4 in the FEIS, the risk of H_2S exposure is comparable to those of the other alternatives.

6. Soils

Due to the highly critical watershed problem that exists in the area between the Green River and the Buckhorn plant site, the East Dry Basin plant site is preferred. Construction of a sour gas truck line, sulfur pipeline, power transmission line, and access road would cause increased erosion and sedimentation into the Green River, as well as intensify the problem of plugging the existing irrigation canal and spreading alluvial material over hay and pasture land. These disturbances would be avoided by locating the treatment plant at East Dry Basin.

TRUNK LINES FOR THE TRANSPORT OF SOUR GAS FROM THE WELL FIELD GATHERING SYSTEMS TO THE PROPOSED TREATMENT PLANTS

Only approximate well field pipeline and trunk line alignments are indicated on Maps S-1 and S-2 at this time. The specific alignments will be determined during the preparation of the Construction and Use (CU) Plans. Any changes in alignment location from those depicted on Maps 1-2, 1-3, and 1-6 of the DEIS may require additional environmental documentation.

1. Pipeline Alignment

Quasar and Williams

Quasar's trunk line from the Darby Mountain, Riley Ridge and North Riley Ridge Units, and Williams trunk line from the Sawmill Area would join in Section 18, T.29N, R113W. A 10-mile trunk line would run from the well field to the East Dry Basin plant site.

Northwest and Mobil

Northwest would purchase gas from Mobil at the wellhead. Northwest's trunk line from the Tip Top and Hogsback Units would begin in Section 32 of T.28N., R.113W., or Section 5 of T.27N., R.113W. Three other gathering lines from the Hogsback Unit would tie in to Northwest's main trunk line off the well field in Sections 5 and 21 of T.27N., R.113W., and Section 3 of T.26N., R.113W. Northwest's trunk line would be approximately 42 miles long, terminating at the Craven Creek plant site. Upon leaving the well field, Northwest's pipeline would parallel their westernmost existing gas pipeline except in the vicinity of Calpet, where an alignment change locating the pipeline at least 1 mile to the west of the populated area would be made, and in the vicinity of the crossings of LaBarge Creek and Fontenelle Creek where the pipeline would be strategically located to avoid potential impacts to residences or businesses.

Exxon

Exxon's trunk line from the Lake Ridge, Fogarty Creek, and Dry Piney Units, and the Dry Piney Annex would leave the well field area in approximately the same location as Northwest. Exxon's trunk line would begin in Section 5 of T.27 N., R.113 W. and would be approximately 43 miles long, terminating at the Shute Creek plant site.

Northwest's and Exxon's sour gas trunk lines would parallel each other to approximately Section 19, of T.23N., R.113 W. At this point they would separate with Exxon's pipeline going southeast to the plant site at Shute Creek.

2. Design Safety Aspects

The presence of H_2S in sour gas will require incorporation of numerous monitoring and safety control measures in the design and operation of the gathering and trunk line systems. These include siting considerations, monitoring and shutdown systems, and emergency response procedures.

Siting Considerations

Well production areas and the gas treatment plant locations are fixed; however, pipeline system locations can be adjusted. Proposed pipeline routing must avoid passing closer than 1 mile to existing residences, communities, recreation areas, and businesses. Emergency shutdown or block valves will be required and spaced along the pipeline to assure protection of residents near the gathering system and truck lines in the unlikely event of a pipeline rupture.

Emergency Procedures

Emergency procedures to be taken in the event of an accidental release of sour gas (H_2S)

will be identified in contingency plans to be prepared by the applicants. Applicants must prepare an individual site-specific H_2S contingency and evacuation plan for the drilling and completion of each well. This is required by BLM regulations (NTL-10) and each plan will outline steps to be taken to control wells and, if necessary, evacuate the area in the event of a blowout.

In addition, the applicants must prepare a contingency and evacuation plan for the operation of the well field, pipelines, and plant facilities. This will identify steps to be taken to control an H_2S gas release from wellheads, gas gathering or trunk lines, or a plant upset during operation. It will include public mass alert and evacuation procedures.

In the event of a sudden pressure drop, trunk line block valves or wellhead valves would stop the flow of gas, depending on the location of the leak. In addition, wells could be remotely shut-in by plant personnel.

Finally, if the sour gas release could not be contained, company personnel would initiate evacuation procedures for residents in the vicinity of the hazard.

Design Requirements

The applicant must use the best available engineering design (i.e., alignment, block valve type and spacing, pipe grade, etc.), best construction techniques (i.e., pipe depth, hydrostatic testing, etc.), and monitoring plans (i.e., surveillance, warning signs, etc.) as approved by the Authorizing Officer to mimimize both the probability of rupture and radius of exposure in the event of an accidental pipeline release of sour gas.

As part of the CU Plan, the applicants will be required to prepare a sour gas pipeline health and safety design, construction, and operation plan for approval by the Authorizing Officer.

Design requirements will reduce both the probability of a rupture and mimimize the extent of exposure for both discomfort and lethal levels of H_2S to sensitive receptors in the event of a sour gas pipeline rupture. The probability of rupture can be reduced by such measures as warning signs, burial depth, pipe thickness and grade, while such measures as block valve types and spacing and pipeline alignment would minimize the exposure radius from the point of rupture in the event of an accident. See Appendix C.6 of the DEIS for a discussion of the effectiveness of block valve spacing and resultant exposure distances.

SALES GAS PIPELINES FOR SHIPMENT OF NATURAL GAS TO EXISTING MAIN PIPELINES

No alternative alignments were considered in the EIS for sales gas pipelines. Comments received on the Quasar and Exxon alignment along the toe of White Mountain, northwest of Rock Springs, make this alignment unacceptable because it traverses prime city expansion land. Also, the Exxon line would cross the Seedskadee National Wildlife Refuge; this received adverse comment. Therefore, other alignment opportunities should be identified for Quasar's and Exxon's sales gas pipelines. An environmental analysis will be required before a final route is selected.

Northwest's proposed sales gas pipeline right-of-way is preferred. It would connect their treatment plant with Northwest's existing 16-inch line 3 miles to the west of the Shute Creek plant site.

CO_2 GAS PIPELINES

The same situation exists for Quasar's and Exxon's CO_2 pipelines as stated for their sales gas pipelines. No adverse comments were received on Northwest's CO_2 pipeline. The proposed 27-mile alignment from the Craven Creek plant south to the Mapco Corridor is preferred.

SULFUR TRANSPORT AND LOADOUT FACILITY

Sulfur, a by-product of H_2S processing in the treatment plants, would be sold as markets are developed. If markets are not identified prior to plant start-up, or if established markets are interrupted, sulfur would be stored at the plant sites until it is needed to supply demand.

Quasar

The Agency Preferred Alternative for transporting produced sulfur is by molten sulfur pipeline. However, since only one alignment has been analyzed, and in consideration of the concerns expressed by the public relative to the sulfur drain locations and the proximity of the pipeline to the Emigrant Trail, additional site-specific environmental analysis would be required before the selection of a final alignment.

Quasar has stated that they would truck the sulfur produced in their first 400-million cfd processing modules to a loadout facility near Opal, Wyoming. This would amount to approximately 654 tons/day.

With the additional processing of 800 million cfd and a production of 1,960 tons of sulfur per day, transportation would be in an above-ground, 54-mile molten sulfur pipeline from the East Dry Basin plant to the terminus near Opal.

The system would be powered by a 69-kilovolt transmission line paralleling the molten sulfur line; the line would receive power from Utah Power & Light Company at the plant site, pipeline midpoint, and loadout facility. Emergency generators to power the heating system would be located at both ends of the pipeline to ensure a source of power should an outage of commercial power occur. See Maps S-1 and S-2 for the general pipeline alignment.

Northwest and Exxon

The rail spur that would service the Craven Creek and Shute Creek plants is the preferred means of sulfur transport. Northwest and Exxon would build a railroad spur from the Union Pacific Railroad line to the treatment plants. The spur would extend from a point about 3 miles east of Opal in a northerly direction about 7 miles to Craven Creek and then easterly about 8.5 miles to Shute Creek. See Map S-2 for location. Northwest's and Exxon's respective production at full capactity would be 757 and 2,240 tons of sulfur per day.

POWER TRANSMISSION LINES

Quasar plans to purchase electrical power from Utah Power & Light Company. Electrical power for operation of their treatment plant would require construction of a 75-mile, 138-kilovolt transmission line from near the Naughton Power Plant to the plant site. Approximately 7 miles of the total distance would parallel an existing transmission line. Tangent structures would be wood pole H-frames. A 69-kilovolt line would run to the sulfur loadout facility. The gas field electrical distribution system would also originate from the plant substation. See Maps S-1 and S-2 for location.

Power for Northwest's and Exxon's treatment plants would also be obtained from Utah Power & Light Company's Naughton Power Plant south of Kemmerer. A 230 or 345-kilovolt transmission line would extend northeast from Naughton, paralleling Quasar's transmission line for approximately 15 miles. The main line would then parallel the railroad spur to the plant sites for a distance of approximately 29 miles. Tangent structures would be lattice steel H-frames. See Map S-2 for location.

TREATMENT PLANT WATER REQUIREMENTS

Quasar and Exxon

Groundwater wells would be used by both applicants for all water requirements (Quasar, 22,010 acre-feet for project life; Exxon, 11,040 acre-feet for project life). Permits for groundwater use must be obtained from the Wyoming State Engineer's Office.

Northwest

The applicant's proposed raw water pipeline is preferred. See Map S-2 for alignment location. Northwest's treatment plant water requirements (2,400 acre-feet for project life) would be supplied from the Green River. A raw water pipeline would extend from a reinforced concrete intake structure on the Green River below the Fontenelle Dam to the plant site. The approximate distance would be 12 miles using 8-inch pipe, buried to a depth of 8 feet. Raw water would be stored in a large tank and serve as plant makeup water storage and fire water storage.

PLANT SITE ACCESS ROADS

The applicant's proposed plant site access routes are preferred. See Maps S-1 and S-2 for locations. A 3.3-mile paved access road would be required from Calpet Road (Sublette County Road 23-134) to the East Dry Basin plant. The Craven Creek plant access road would extend from Highway 240 directly east to the treatment plant. It would be paved and 1.4 miles in length. The Shute Creek plant access road would extend from Highway 240 directly east to the treatment plant. It would be paved and 8.5 miles in length. Access roads to all plant sites would be built to American Association of State Highway Transportation Officials standards.

EMPLOYEE HOUSING

All applicants would be required to provide construction camps for employee and contractor housing. If the construction camps are located on public land at a site other than that analyzed in the EIS, additional environmental analysis may be required.

GRAVEL, RIPRAP, AND FILL MATERIALS REQUIRED FOR CONSTRUCTION

Required gravel, riprap, and fill materials will be

obtained from: (1) the right-of-way; (2) commercial sources (which would require transportation to the location); or (3) adjacent lands where permitted by the federal surface management agency or the landowner. (Note: If value of needed material exceeds $5,000, sale must be competitive.)

WASTEWATER

The effects on groundwater of deep well reinjection of waste water from the sour gas treatment plants and well field dehydrators have not been fully analyzed due to lack of information on the applicant's injection engineering plans and specific water resource data. Prior to allowing this activity, the BLM will require further analysis of impacts. In addition, Wyoming Oil and Gas Commission, Wyoming Department of Environmental Quality, and BLM -Minerals Division must review and approve the applicants' disposal plans. The necessary permits or approvals would be required before the applicant could begin disposal.

GAS VENTING

It is the agencies' preference to allow the applicants to vent CO_2 until an economic market is identified by the BLM. If a market is identified, the CO_2 must either be sold or compensatory royalty will be assessed for the marketable volume. In addition, the helium will be allowed to be vented until such time as the Bureau of Mines makes a final determination regarding its disposition.

SECTION 2

COMPARATIVE ANALYSIS OF PROPOSED ACTION AND ALTERNATIVES

SITING ALTERNATIVES

A comparison of significant environmental impacts for the Proposed Action and the siting alternatives is presented in Table 2-1. The comparative analysis was developed using information included in Chapter 4 ***of the DEIS as modified by the Errata Summary.*** The table presents impacts for each siting alternative based on a complete scenario for developing the well field, processing sour gas, and transporting sales gas and by-products to market. The reader is reminded that the impacts presented in Table 2-1 are ***mitigated*** with respect to the application of the measures described in Chapter 4 and Appendices B and C.6 ***of the DEIS. This is a change from Chapter 2 in the DEIS where unmitigated impacts were presented. It was felt that comparison of alternatives would be more meaningful if the committed mitigation measures were included. Thus, a change has been made between the DEIS and FEIS.***

The numbers presented in the tables represent ***the mitigated*** impacts that can be expected for each alternative during construction (some of which are short term) as well as impacts that can be expected during operation (most of which are long term). For example, under population increase, the largest change would occur during construction. Communities would experience smaller population increases, many of which also exceed the impact significance criteria, during project operation.

There are several environmental impacts that, although they are significant, do not vary among the alternatives; therefore, the evaluation of these impacts does not enable comparison of the various siting alternatives. Many of these impacts would occur in the well field, which is common to all alternatives. The impacts which are the same for all siting alternatives are listed below by environmental resource.

Wildlife and Fisheries:

- Impacts to federal T&E wildlife species.
- Increased sedimentation of trout streams located in the well field.
- Impacts from possible leaks or spills.

Health & Safety:

- Frequency of well blowouts and gathering system leaks or ruptures.

Water Resources:

- Construction of the ***rail siding portion of*** the sulfur loadout facility within the 100-year floodplain of the Hams Fork.
- Sedimentation of surface streams from construction runoff.
- Possible contamination of surface water from leaks or spills.
- ***Possible*** degradation of groundwater aquifers.
- Water demand.

Soils and Vegetation:

- Acres of aspen lost.

Visual Resources:

- Site-specific and combined visual change impacts within the well field.

Recreation:

- Increase in regional recreation demand.
- Decrease in quality of hunting and fishing.
- Number of recreation areas affected.

Wilderness:

- Increase in recreation demand on wilderness areas.

TABLE 2-1
COMPARISON OF *MITIGATED* SIGNIFICANT IMPACTS FOR SITING ALTERNATIVES

	Proposed Action	Buckhorn Alternative	Shute Creek Alternative	Northern Alternative
Socioeconomics				
Percentage Change in Population (%)				
Lincoln County				
Construction	37	37 (0)	42 (+5)	28 (-9)
Operation	8	8 (0)	15 (+7)	7 (-1)
Kemmerer				
Construction	58	58 (0)	72 (+4)	32 (-26)
Operation	9	9 (0)	24 (+15)	6 (-3)
Diamondville				
Construction	108	108 (0)	136 (+28)	55 (-53)
Operation	15	15 (0)	45 (+30)	10 (-5)
LaBarge				
Construction	345	345 (0)	265 (-80)	472 (+127)
Operation	142	142 (0)	106 (-36)	142 (0)
Sublette County				
Construction	66	66 (0)	49 (-17)	89 (+23)
Operation	36	36 (0)	20 (-16)	39 (+3)
Big Piney				
Construction	149	149 (0)	109 (-40)	201 (+52)
Operation	82	82 (0)	44 (-38)	89 (+7)
Marbleton				
Construction	136	136 (0)	99 (-37)	183 (+47)
Operation	75	75 (0)	40 (-35)	81 (+6)
Pinedale				
Construction	14	14 (0)	11 (-3)	18 (+4)
Operation	8	8 (0)	4 (-4)	8 (0)
Sweetwater County				
Construction	3	3 (0)	4 (+1)	2 (-1)
Operation	0	0 (0)	0 (0)	0 (0)
Granger				
Construction	61	61 (0)	76 (+15)	39 (-22)
Operation	3	3 (0)	5 (+2)	2 (-1)
Housing Shortfall (Units)[1]				
Lincoln County				
Construction	***1,350***	***1,350 (0)***	***1,585 (+236)***	***1,187 (-972)***
Operation	447	447 (0)	801 (+354)	381 (-66)
Kemmerer				
Construction	***811***	***811 (0)***	***1,004 (+193)***	***360 (-451)***
Operation	141	141 (0)	418 (+277)	91 (-50)
Diamondville				
Construction	***450***	***450 (0)***	***568 (-118)***	***206 (-244)***
Operation	72	72 (0)	219 (-147)	43 (-29)
LaBarge				
Construction	468	468 (0)	363 (-105)	539 (+71)
Operation	226	226 (0)	170 (-56)	190 (-36)
Sublette County				
Construction	***1,115***	***1,115 (0)***	***821 (-294)***	***1,239 (+124)***
Operation	695	695 (0)	379 (-316)	761 (+66)
Big Piney				
Construction	***349***	***349 (0)***	***254 (-95)***	***447 (+98)***
Operation	197	197 (0)	107 (-90)	200 (+3)
Marbleton				
Construction	256	256 (0)	187 (-69)	413 (+157)
Operation	143	143 (0)	78 (-65)	185 (+42)
Pinedale				
Construction	***55***	***55 (0)***	***44 (-11)***	***60 (+5)***
Operation	33	33 (0)	20 (-13)	37 (+4)
Granger				
Construction	***43***	***43 (0)***	***52 (+9)***	***28 (-15)***
Operation	2	2 (0)	14 (+12)	2 (0)

TABLE 2-1 (continued)
COMPARISON OF *MITIGATED* SIGNIFICANT IMPACTS FOR SITING ALTERNATIVES

	Proposed Action	Buckhorn Alternative	Shute Creek Alternative	Northern Alternative
Socioeconomics (Con't)				
Personal Income (Percent above Baseline)				
Lincoln County				
Construction	74	74 (0)	83 (+9)	56 (-18)
Operation	13	13 (0)	22 (+9)	11 (-2)
Sublette County				
Construction	152	152 (0)	113 (-39)	202 (+50)
Operation	72	72 (0)	42 (-30)	77 (+5)
Sweetwater County				
Construction	5	5 (0)	6 (+1)	4 (-1)
Operation	0	0 (0)	0 (0)	0 (0)
Wildlife and Fisheries				
Acres of Critical Range Disturbed				
Elk Calving Range				
Construction	1,107	1,107 (0)	1,107 (0)	1,107 (0)
Operation	1,107	1,107 (0)	1,107 (0)	1,107 (0)
Elk Winter Range				
Construction	1,479	1,479 (0)	1,685 (+206)	1,355 (-124)
Operation	1,019	1,019 (0)	1,019 (0)	1,019 (0)
Moose Winter Range				
Construction	586	447 (-139)	452 (-134)	595 (+9)
Operation	287	287 (0)	287 (0)	287 (0)
Mule Deer Winter Range				
Construction	2,957	2,579 (-378)	1,610 (-1,347)	3,020 (+63)
Operation	1,172	782 (-390)	142 (-1,030)	1,202 (+30)
Pronghorn Winter Range				
Construction	2,281	2,379 (+98)	1,342 (-939)	2,344 (+63)
Operation	640	640 (0)	0 (-640)	640 (0)
Pronghorn Summer Range				
Construction	1,891	1,897 (+6)	1,687 (-204)	1,135 (-756)
Operation	840	840 (0)	900 (+60)	200 (-640)
Prairie Dog Towns				
Construction	579	721 (+142)	1,064 (+486)	540 (-39)
Operation	191	191 (0)	163 (-28)	123 (-68)
Total Number of Perennial Stream Crossings	100	101 (+1)	102 (+2)	103 (+3)
Sour Gas Trunk Line Perennial Stream Crossings	5	6 (+1)	4 (-1)	2 (-3)
Health and Safety				
Miles of Sour Gas Trunk Line	54	68 (+14)	111 (+57)	33 (-21)
Number of Trunk Line Ruptures Expected During Life of Project	0.33	0.41 (+0.08)	0.67 (+0.34)	0.20 (-0.13)
Number of People ***in Populated Areas*** at Risk of ***Significant*** H_2S Exposure ***(500 parts/million instantaneous)*** in 1990 (trunk line rupture)	54	54 (0)	***54 (0)***	0 (-54)
Individual Annual Risk of ***Significant*** Exposure ***in Populated Areas***				
LaBarge	negligible	negligible	***negligible***	negligible
Big Piney	negligible	negligible	negligible	negligible
Marbleton	negligible	negligible	negligible	negligible
Calpet	***0.000011***	***0.000011***	***0.000018***	negligible
Fontenelle Recreation Area	negligible	negligible	negligible	negligible
Individual Annual Risk of Significant Exposure at Sensitive Receptors	***0.000017***	***0.000017 (0)***	***0.000025 (+0.000008)***	***0.000017 (0)***

TABLE 2-1 (continued)
COMPARISON OF *MITIGATED* SIGNIFICANT IMPACTS FOR SITING ALTERNATIVES

	Proposed Action	Buckhorn Alternative	Shute Creek Alternative	Northern Alternative
Water Resources				
Decrease in the pH of lakes in Class I areas greater than 0.1	***0.09 to 0.17***	***0.09 to 0.17 (0) (0)***	***0.07 to 0.13 (−0.02) (−0.04)***	***0.10 to 0.20 (+0.01) (+0.03)***
Air Quality				
Ambient Air Impacts from Emissions Exceed Applicable Standards				
SO_2 (PSD Class II, 24-hour, 91 $\mu g/m^3$)	***no exceedance***	no exceedance	no exceedance	no exceedance
H_2S (WAAQS, 1/2-hour, 40 $\mu g/m^3$)	***no exceedance***	***no exceedance***	***no exceedance***	***no exceedance***
Ambient Air Impacts from Emissions Exceed Odor Significance Level (6.5 $\mu g/m^3$)	***East Dry Basin < 40,*** West Dry Basin 12, Big Mesa 7	East Dry Basin 7, West Dry Basin 12, ***Buckhorn < 40***	***Buckhorn < 40,***	East Dry Basin 9, West Dry Basin 12, ***Buckhorn < 40***
Ambient Air Impacts from Emissions Compared to Class I Standards (PSD, 24-hour, 5 $\mu g/m^3$)[3]				
Maximum Concentration SO_2				
Existing Class I Areas	***4.1 in Bridger Wilderness***	***4.8 (+0.7) in Bridger Wilderness***	***3.7 (-0.4) in Bridger Wilderness***	***5.5 (+1.4) in Bridger Wilderness***
Proposed Class I Areas	4.7 at Scab Creek	5.9 (+1.2) at Scab Creek	5.3 (+0.6) at Fossil Butte	6.5 (+1.8) at Scab Creek
Highest Second-Highest Concentration SO_2				
Existing Class I Areas	***NA***	***NA***	***NA***	***3.9***
Proposed Class I Areas	NA	4.3	4.3	4.7
Soils and Vegetation				
Total Acres Disturbed				
Construction	12,852	12,983 (+131)	12,115 (−737)	13,050 (+198)
Operation	4,154	4,164 (+64)	3,620 (+534)	4,028 (+126)
Total Miles of Linear Facilities (Outside Well Field)	636.0	653.5 (+17.5)	652.5 (+16.5)	672.5 (+36.0)
Acres of Riparian Vegetation Disturbed				
Construction	249	252 (+3)	236 (−13)	257 (+8)
Operation	63	63 (0)	63 (0)	63 (0)
Acres of Sensitive Rehabilitation Unit Disturbed	3,969	3,492 (−477)	4,130 ***(+661)***	***3,690 (-279)***
Acres not Reclaimed at Abandonment	641	633 (−8)	704 (+63)	628 (+13)
Visual Resources				
Miles of Significant Impact	103	103 (0)	93 (−10)	91 (−12)
Miles of Highly Significant Impact	26	26 (0)	26 (0)	26 (0)
Number of Plant Sites with Significant Impacts	3	3 (0)	2 (−1)	2 (−1)
Number of Plant Sites with Highly Significant Impacts	1	0 (−1)	0 (−1)	1 (0)
Cultural Resources				
Number of Cultural Sites Impacted	128	130 (+2)	168 (+40)	94 (−34)

TABLE 2-1 (continued)
COMPARISON OF *MITIGATED* SIGNIFICANT IMPACTS FOR SITING ALTERNATIVES

	Proposed Action	Buckhorn Alternative	Shute Creek Alternative	Northern Alternative
Agriculture/Grazing				
Number of AUMs Lost				
Construction	690	664 (-26)	585 (-105)	657 (-33)
Operation	223	213 (-10)	175 (-48)	203 (-20)
Number of Crossings of Slate Creek Sheep Trail				
Construction	4	4 (0)	6 (+2)	2 (-2)
Operation	1	1 (0)	2 (+1)	1 (0)
Transportation				
Percent Above Service Volume C Operating Standard for Significantly Impacted Road Segments				
Construction				
U.S. 189, LaBarge to County Road 23-134	10	10 (0)	0 (-10)	98 (+88)
U.S. 189 at Big Piney	54	54 (0)	0 (-54)	137 (+83)
U.S. 191 West of Pinedale				
U.S. 30, Kemmerer to Opal	156	156 (0)	189 (+33)	11 (-145)
U.S. 30 East of Opal	86	86 (0)	86 (0)	50 (-36)
S.R. 240 North of Opal	43	43 (0)	67 (+24)	0 (-43)
Operation				
U.S. 189 at Big Piney	3	3 (0)	0 (-3)	9 (+6)
U.S. 191 West of Pinedale	8	8 (0)	0 (-8)	0 (-8)
U.S. 30, Kemmerer to Opal	17	17 (0)	42 (-25)	12 (-5)
U.S. 30, East of Opal	55	55 (0)	53 (-2)	0 (-55)
Increase in Number of Traffic Accidents				
Construction	135	135 (0)	145 (+10)	190 (+55)
Operation	45	45 (0)	48 (+3)	62 (+17)
Land Use Plans, Controls, and Constraints				
Conflicts with Existing Land Use Plans				
BLM Management Framework Plan (miles of transmission line)	76.0	80.5 (+4.5)	83.0 (+7.0)	72.0 (-4.0)
Seedskadee National Wildlife Refuge (miles of pipeline)	0	0 (0)	2 (+2)	0 (0)
Sublette County Zoning (plant sites)	East Dry Basin West Dry Basin Big Mesa	East Dry Basin West Dry Basin Buckhorn	Buckhorn	East Dry Basin West Dry Basin Big Mesa Buckhorn

Note: Numbers in parentheses ( ) indicate the difference from the Proposed Action.

[1]***This assumes that most construction related demand for single status housing (the "other" category discussed on page 4-4 of the DEIS) would be met by the construction camps required by mitigation measure S-1.***

[2]***A sensitive receptor is a permanently occupied dwelling (such as a ranch house or mobile home) or a business/industrial site (such as the Big Piney Compressor Station). While no attempt has been made to quantify the number of people at a sensitive receptor, it would usually be smaller than the number in a populated area (such as LaBarge). See Map 2-1 for locations of sensitive receptors and populated areas.***

[3]Short-term standards in Class I areas allow one exceedance per year. This is important because it means the maximum value can be ignored at each receptor and instead, the highest remaining value (termed the highest second-highest) is compared to the increment or standard. This highest second-highest value must exceed the limit for the impacts to be deemed significant.

Agriculture/Grazing:

- Number of grazing allotments losing more than 5 percent of their AUMs.
- Loss in hay production.

Timber:

- Acres of timber cleared.
- Increased access to areas of proposed timber sales.

Noise:

- Increased noise along highways from increased truck traffic.

DIFFERENCES AMONG SITING ALTERNATIVES

In addition to the information presented in Table 2-1, the following paragraphs briefly summarize the major differences among the siting alternatives. Many of the differences are not quantitative, so they do not appear in the table. However, the impacts represent qualitative differences among alternatives which may be of interest to decision makers and the public. ***Again, the reader is reminded that the impacts discussed are those that would remain following the implementation of mitigation measures.***

Socioeconomics

Differences among the alternatives are primarily a function of the location of the plant sites. The Proposed Action and Buckhorn Alternative would have the same impacts on Lincoln and Sublette Counties. The impacts of the Shute Creek Alternative would be concentrated in Lincoln County which is the strongest of the two counties in terms of fiscal condition. The impacts of the Northern Alternative, on the other hand, would be concentrated in Sublette County which is not as well prepared, from the standpoint of finances or services, to deal with the growth that would be associated with project development.

Wildlife and Fisheries

The majority of significant impacts to big game critical range and high quality trout fisheries would occur as a result of the development of the well field. Thus, there would be small differences among alternatives for these impacts. Short and long-term impacts to wildlife caused by critical range disturbances would vary among alternatives off the well field (Table 2-1). Overall, the Shute Creek Alternative would result in the least long-term disturbance to important critical ranges. Human population-related impacts, such as legal and illegal hunting and fishing, wildlife harassment, road kills, and unintentional disturbance, would also vary among alternatives. Impacts from the Proposed Action and the Buckhorn Alternative would be very similar. Impacts from the Northern Alternative would be greatest due to the concentration of population in the northern part of the study area, closest to important big game habitat and trout streams. Impacts from the Shute Creek Alternative would be the least because of the more even distribution of increased population in the study area and the smallest population increase in the Big Piney area, near the critical big game range and sensitive trout fisheries.

All alternatives except the Proposed Action would have sour gas trunk lines crossing the Green River. This could significantly affect fisheries in the event of a leak or rupture.

Health and Safety

Health and safety impacts would be mitigated by revised mitigation measure H-4 (see the Errata Summary for revision to page 4-134 in the DEIS). This measure requires that no sour gas trunk line be located closer than 1 mile to populated areas or sensitive receptors. The measure will reduce the probability of significant H_2S exposure to less than 3 in 100,000. It may require the relocation of the trunk lines away from sensitive areas. If the lines are moved outside of the 1-mile wide corridor analyzed in the DEIS, additional environmental analysis would be required.

Water Resources

Only minor differences in impacts to water resources among the four siting alternatives have been identified. Since most impacts would occur from well drilling and construction of access roads and pipelines in the well field, these impacts would be common to all alternatives. ***Because the Shute Creek Alternative would locate the gas treatment plants furthest away from the Bridger Wilderness, potential decreases in pH in high mountain lakes resulting from acid deposition would be the least for this alternative. However, all alternatives could cause pH decreases in lakes in Class I areas that would exceed the significance criteria.*** One difference that would not constitute a change in significant impacts would occur with the Northern Alternative. Under this

alternative, Northwest would utilize groundwater for its plant water requirements rather than surface water from the Green River, as under the other alternatives.

Air Quality

No Class I air quality standards would be violated for any alternative. ***All plants would comply with PSD Class II standards for SO_2 and WAAQS standards for H_2S.*** Combined air quality effects for SO_2 would be greatest for the Northern Alternative where all four plants would be located in the northern part of the study area, and emissions from all four plants could contribute to combined annual average SO_2 impacts. However, these impacts would not be significant. Combined SO_2 impacts would be the least for the Shute Creek Alternative. Odor impacts from H_2S would be the greatest for the Northern Alternative and least for the Shute Creek Alternative.

Soils and Vegetation

The four siting alternatives differ very slightly in their impacts to soils and vegetation. The total number of acres disturbed varies by less than 6 percent among alternatives. The greatest difference is found in the number of acres of sensitive rehabilitation units disturbed. The Northern Alternative would disturb the least, while the Shute Creek Alternative would disturb the most. The difference between these two alternatives is nearly 23 percent.

Visual Resources

The Proposed Action would be the most visually disruptive of the siting alternatives; this alternative includes four plant sites, one of which would cause highly significant impacts to visual resources. The Shute Creek Alternative, because of the use of only three sites, one of which is insignificant in its visual impacts, would be the least visually disruptive. The sulfur pipeline for each alternative would be the single most disruptive component as it would create long-term significant impacts along 26 of the proposed 54 miles of corridor.

Cultural Resources

The differences in impacts of the siting alternatives are based on the number of cultural resources identified during previous surveys of the study area. The numbers range from 94 resources for the Northern Alternative to 168 for the Shute Creek Alternative. A total of 128 and 130 sites have been identified for the Proposed Action and the Buckhorn Alternative, respectively. Less than 5 percent of the study area for the siting alternatives has been surveyed; therefore, a survey of the proposed area of disturbance will determine the actual number of sites to be impacted.

Recreation

Due to the regional nature of recreation use patterns, the differences in impacts by alternative cannot be quantified. It is expected that the differences among alternatives would be small; however, alternatives which concentrate population in the Big Piney area would be expected to have the greatest impacts on recreation. Thus, the Northern Alternative would have the greatest impacts while the Shute Creek Alternative would have the least.

Wilderness

Impacts to wilderness are a function of the area-wide population increase and potential air quality degradation. This does not vary significantly by alternative, hence the impacts to wilderness are common to all of the siting and component alternatives. Potential impacts to ***one*** air quality related value (AQRV), specifically ***water quality related*** to acid deposition in high mountain lakes, ***has*** been determined to be significant.

Agriculture/Grazing

Impacts to agriculture in terms of AUMs lost would be somewhat greater under the Proposed Action than the other siting alternatives. In total, the impacts for each alternative would be insignificant though losses would be significant to five allotments regardless of the choice of plant site.

Timber

Almost all impacts to timber resources are the result of well field activities. There would be no differences in impacts for the siting or component alternatives.

Transportation

The Northern Alternative would generate the greatest number of vehicle miles traveled, and therefore, would have the greatest accident potential. The

impact from this alternative would be concentrated along U.S. 189 whereas the impacts from the other three siting alternatives would be greatest on U.S. 30 and State Route 240.

Land Use Plans, Controls, and Constraints

The most significant land use conflict would result from Exxon's CO_2 and sales gas proposed pipeline (Shute Creek Alternative) ***corridors*** that would cross the Seedskadee National Wildlife Refuge. Other land use conflicts would result from the siting of corridors and conflicts with land management agency objectives that encourage sharing of corridors. Plant sites that are currently not permitted under Sublette County zoning would require local administrative action to permit construction.

Noise

Significant noise impacts result mostly from construction-related truck traffic. These would be significant within one-half mile of U.S. 189 from Big Piney to LaBarge and south to Kemmerer and east on U.S. 30 from Kemmerer to Opal and Granger. As the frequency of travel on these roads varies by alternative, noise impacts would be relatively greater on U.S. 189 under the Northern Alternative and relatively greater on U.S. 30 under the other three siting options.

Significant Impact Summary

In order to facilitate review, the following sections summarize the significant beneficial and adverse impacts (based on the significance criteria presented in Chapter 4 ***of the DEIS***) for each siting alternative. Please refer to Table 2-1 or specific sections in Chapter 4 of the DEIS for quantification and details.

Proposed Action

Socioeconomics

- Shortfall in housing units (see Table 2-1).
- Shortfall in revenue for capital facilities in Diamondville, LaBarge, Big Piney, Marbleton, and Granger.
- Shortfall in revenue for personnel in LaBarge, Sublette County, Big Piney, Marbleton, and Granger.
- ***Increases in personal income, employment opportunities, and local revenue.***

Wildlife and Fisheries:

- Disturbance of critical wildlife range (see Table 2-1).
- Increased poaching, harassment, and road kills.
- Possible adverse effects on the black-footed ferret.
- Increase sedimentation of trout streams located in the well field.
- Increased fishing pressure, particularly on the Colorado River cutthroat trout.
- Impacts from possible leaks or spills.

Health & Safety:

- Potential for 2.8 well blowouts during the life of the project.
- Potential for 2.74 gathering system leaks or ruptures during the life of the project.
- Potential for 0.33 trunk line ruptures during the life of the project.
- ***Slight risk of lethal exposure to H_2S from trunk line ruptures in Calpet and at sensitive receptors.***
- ***Slight risk of significant (discomfort) exposure to H_2S from trunk line ruptures in Calpet and at sensitive receptors.***

Water Resources:

- ***Decreases in the pH of lakes in Class I areas could exceed significance criteria.***
- Location of the ***rail siding portion of the*** sulfur loadout within 100-year floodplain of Hams Fork.
- Several potential impacts to surface and groundwater. Probability and extent unknown due to data gaps.

Air Quality:

- ***H_2S emissions from the East Dry Basin, West***

Dry Basin, and Big Mesa plants are predicted to exceed significance criteria for odor.

Soils and Vegetation:

- Disturbance of 249 acres of riparian vegetation during construction.
- Long-term loss of 63 acres of riparian vegetation during operation.

Visual Resources:

- Combined visual change impacts (significant and highly significant) to 44 residences and 129 miles of road.

Cultural Resources:

- Potential impact to 128 cultural sites.

Recreation:

- Increased overall recreation demand (27 percent in 1986).
- Increased hunting (26 percent) and fishing (64 percent) demand.

Wilderness:

- Significant social, physical, and biological impacts due to increased visitor use, particularly in the Bridger Wilderness.
- ***Significant impact to Air Quality Related Values (AQRVs), specifically water quality in lakes, in the Bridger Wilderness.***

Agriculture/Grazing:

- Number of AUMs in 5 grazing allotments reduced by more than 5 percent.

Timber Resources:

- Significant beneficial impact due to the construction of additional access roads near future timber sales.

Transportation:

- The Level of Service C traffic volume would be exceeded on U.S. 189, U.S. 191, U.S. 30, and State Route 240.
- An additional 130 to 140 traffic accidents would be expected each year during construction.
- Accelerated roadway deterioration would be expected on U.S. 189.

Land Use Plans, Controls, and Constraints:

- BLM Management Framework Plan goals for shared corridors would be violated (see Table 2-1).
- Plant sites in Sublette County would violate current zoning regulations (see Table 2-1).

Noise:

- Residences within one-half mile of U.S. 189 and U.S. 30 would experience increased noise from project-related truck traffic.

Buckhorn Alternative

Socioeconomics:

- Shortfall in housing units (see Table 2-1).
- Shortfall in revenue for capital facilities in Diamondville, LaBarge, Big Piney, Marbleton, and Granger.
- Shortfall in revenue for personnel in LaBarge, Sublette County, Big Piney, Marbleton, and Granger.
- ***Increases in personal income, employment opportunities, and local revenue.***

Wildlife and Fisheries:

- Disturbance of critical wildlife range (see Table 2-1).
- Increased poaching, harassment, and road kills.
- Possible adverse effects on the black-footed ferret.
- Increase sedimentation of trout streams located in the well field.
- Increased fishing pressure, particularly on the Colorado River cutthroat trout.
- Impacts from possible leaks or spills.

Health & Safety:

- Potential for 2.8 well blowouts during the life of the project.
- Potential for 2.74 gathering system leaks or ruptures during the life of the project.
- Potential for 0.41 trunk line ruptures during the life of the project.
- ***Slight risk of lethal exposure to H_2S from trunk line ruptures in Calpet and at sensitive receptors.***
- ***Slight risk of significant (discomfort) exposure to H_2S from trunk line ruptures in Calpet and at sensitive receptors.***

Water Resources:

- ***Decreases in the pH of lakes in Class I areas could exceed significance criteria.***
- Location of the ***rail siding portion of the*** sulfur loadout within 100-year floodplain of Hams Fork.
- Several potential impacts to surface and groundwater. Probability and extent unknown due to data gaps.

Air Quality:

- ***H_2S emissions from the East Dry Basin, West Dry Basin, and Big Mesa plants are predicted to exceed significance criteria for odor.***

Soils and Vegetation:

- Disturbance of 252 acres of riparian vegetation during construction.
- Long-term loss of 63 acres of riparian vegetation during operation.

Visual Resources:

- Combined visual change impacts (significant and highly significant) to 47 residences and 129 miles of road.

Cultural Resources:

- Potential impact to 130 cultural sites.

Recreation:

- Increased overall recreation demand (27 percent in 1986).
- Increased hunting (26 percent) and fishing (64 percent) demand.

Wilderness:

- Significant social, physical, and biological impacts due to increased visitor use, particularly in the Bridger Wilderness.
- ***Significant impact to Air Quality Related Values (AQRVs), specifically water quality in lakes, in the Bridger Wilderness.***

Agriculture/Grazing:

- Number of AUMs in 5 grazing allotments reduced by more than 5 percent.

Timber Resources:

- Significant beneficial impact due to the construction of additional access roads near future timber sales.

Transportation:

- The Level of Service C traffic volume would be exceeded on U.S. 189, U.S. 191, U.S. 30, and State Route 240.
- An additional 130 to 140 traffic accidents would be expected each year during construction.
- Accelerated roadway deterioration would be expected on U.S. 189.

Land Use Plans, Controls, and Constraints:

- BLM Management Framework Plan goals for shared corridors would be violated (see Table 2-1).
- Plant sites in Sublette County would violate current zoning regulations (see Table 2-1).

Noise:

- Residences within one-half mile of U.S. 189 and U.S. 30 would experience increased noise from project-related truck traffic.

Shute Creek Alternative

Socioeconomics:

- Shortfall in housing units (see Table 2-1).
- Shortfall in revenue for capital facilities in Diamondville, LaBarge, Big Piney, Marbleton, and Granger.
- Shortfall in revenue for personnel in LaBarge, Sublette County, Big Piney, Marbleton, and Granger.
- ***Increases in personal income, employment opportunities, and local revenue.***

Wildlife and Fisheries:

- Disturbance of critical wildlife range (see Table 2-1).
- Increased poaching, harassment, and road kills.
- Possible adverse effects on the black-footed ferret.
- Increase sedimentation of trout streams located in the well field.
- Increased fishing pressure, particularly on the Colorado River cutthroat trout.
- Impacts from possible leaks or spills.

Health & Safety:

- Potential for 2.8 well blowouts during the life of the project.
- Potential for 2.74 gathering system leaks or ruptures during the life of the project.
- Potential for 0.67 trunk line ruptures during the life of the project.
- ***Slight risk of lethal exposure to H_2S from trunk line ruptures in Calpet and at sensitive receptors.***
- ***Slight risk of significant (discomfort) exposure to H_2S from trunk line ruptures in Calpet and at sensitive receptors.***

Water Resources:

- ***Decreases in the pH of lakes in Class I areas could exceed significance criteria.***
- Location of the ***rail siding portion of*** the sulfur loadout within 100-year floodplain of Hams Fork.
- Several potential impacts to surface and groundwater. Probability and extent unknown due to data gaps.

Air Quality:

- ***H_2S emissions from the Buckhorn plant are predicted to exceed significance criteria for odor.***

Soils and Vegetation:

- Disturbance of 236 acres of riparian vegetation during construction.
- Long-term loss of 63 acres of riparian vegetation during operation.

Visual Resources:

- Combined visual change impacts (significant and highly significant) to 47 residences and 119 miles of road.

Cultural Resources:

- Potential impact to 168 cultural sites.

Recreation:

- Increased overall recreation demand (27 percent in 1986).
- Increased hunting (26 percent) and fishing (64 percent) demand.

Wilderness:

- Significant social, physical, and biological impacts due to increased visitor use, particularly in the Bridger Wilderness.
- ***Significant impact to AQRVs, specifically water quality in lakes in the Bridger Wilderness.***

Agriculture/Grazing:

- Number of AUMs in 5 grazing allotments reduced by more than 5 percent.

Timber Resources:

- Significant beneficial impact due to the construction of additional access roads near future timber sales.

Transportation:

- The Level of Service C traffic volume would be exceeded on U.S. 30 and State Route 240.
- An additional 145 traffic accidents would be expected each year during construction.
- Accelerated roadway deterioration would be expected on U.S. 189.

Land Use Plans, Controls, and Constraints:

- BLM Management Framework Plan goals for shared corridors would be violated (see Table 2-1).
- Plant sites in Sublette County would violate current zoning regulations (see Table 2-1).
- Exxon's sales gas and CO_2 pipeline would conflict with FWS management plans for the Seedskadee National Wildlife Refuge.

Noise:

- Residences within one-half mile of U.S. 189 and U.S. 30 would experience increased noise from project-related truck traffic.

Northern Alternative

Socioeconomics:

- Shortfall in housing units (see Table 2-1).
- Shortfall in revenue for capital facilities in Diamondville, LaBarge, Big Piney, Marbleton, and Granger.
- Shortfall in revenue for personnel in LaBarge, Sublette County, Big Piney, Marbleton, and Granger.
- ***Increases in personal income, employment opportunities, and local revenue.***

Wildlife and Fisheries:

- Disturbance of critical wildlife range (see Table 2-1).
- Increased poaching, harassment, and road kills.
- Possible adverse effects on the black-footed ferret.
- Increase sedimentation of trout streams located in the well field.
- Increased fishing pressure, particularly on the Colorado River cutthroat trout.
- Impacts from possible leaks or spills.

Health & Safety:

- Potential for 2.8 well blowouts during the life of the project.
- Potential for 2.74 gathering system leaks or ruptures during the life of the project.
- Potential for 0.20 trunk line ruptures during the life of the project.
- ***Slight risk of lethal exposure to H_2S from trunk line ruptures at sensitive receptors.***
- ***Slight risk of significant (discomfort) exposure to H_2S from trunk line ruptures at sensitive receptors.***

Water Resources:

- ***Decreases in the pH of lakes in Class I areas could exceed significance criteria.***
- Location of the ***rail siding portion of*** the sulfur loadout within 100-year floodplain of Hams Fork.
- Several potential impacts to surface and groundwater. Probability and extent unknown due to data gaps.

Air Quality:

- ***H_2S emissions from the East Dry Basin, West Dry Basin, Big Mesa, and Buckhorn plants are***

predicted to exceed significance criteria for odor.

Soils and Vegetation:

- Disturbance of 257 acres of riparian vegetation during construction.
- Long-term loss of 63 acres of riparian vegetation during operation.

Visual Resources:

- Combined visual change impacts (significant and highly significant) to 47 residences and 117 miles of road.

Cultural Resources:

- Potential impact to 94 cultural sites.

Recreation:

- Increased overall recreation demand (27 percent in 1986).
- Increased hunting (26 percent) and fishing (64 percent) demand.

Wilderness:

- Significant social, physical, and biological impacts due to increased visitor use, particularly in the Bridger Wilderness.
- ***Significant impact to AQRVs, specifically water quality in lakes in the Bridger Wilderness.***

Agriculture/Grazing:

- Number of AUMs in 5 grazing allotments reduced by more than 5 percent.

Timber Resources:

- Significant beneficial impact due to the construction of additional access roads near future timber sales.

Transportation:

- The Level of Service C traffic volume would be exceeded on U.S. 189 and U.S. 30.
- An additional 190 traffic accidents would be expected each year during construction.
- Accelerated roadway deterioration would be expected on U.S. 189.

Land Use Plans, Controls, and Constraints:

- BLM Management Framework Plan goals for shared corridors would be violated (see Table 2-1).
- Plant sites in Sublette County would violate current zoning regulations (see Table 2-1).

Noise:

- Residences within one-half mile of U.S. 189 and U.S. 30 would experience increased noise from project-related truck traffic.

COMPONENT ALTERNATIVES

Quantitative differences in impacts associated with the component alternatives ***as mitigated*** are summarized in Tables 2-2 through 2-4. Only a few significant impacts would be caused by these component alternatives. Most component alternatives would cause no change in the impacts identified for a given siting alternative, while some would reduce these impacts. Significant adverse and beneficial effects of the component alternatives are noted below.

Sulfur Transport:

- Various increases and decreases in the disturbance of critical wildlife range would occur if a railroad from West Dry Basin or Shute Creek were constructed (see Table 2-2).
- The sulfur transport alternative would cause some sedimentation of streams at crossing locations during construction. This would be particularly important for the railroad crossing of the Green River.
- A rail spur from West Dry Basin would disturb additional riparian vegetation and sensitive rehabilitation units.
- A rail spur from West Dry Basin would reduce the miles of significant visual impact.

Power Supply:

- Changes in disturbance of critical wildlife range among transmission systems varies with species (see Table 2-3). No significant

TABLE 2-2
COMPARISON OF *MITIGATED* IMPACTS FOR SULFUR TRANSPORT COMPONENT ALTERNATIVES

	Sulfur Pipeline from West Dry Basin (Proposed Action)	Railroad from West Dry Basin	Sulfur Pipeline from Shute Creek (Shute Creek Alternative)	Railroad from Shute Creek
Wildlife and Fisheries				
Acres of Critical Range Disturbed[1]				
Elk Calving Range	0	0 (0)	0	0 (0)
Elk Winter Range	206	0 (-206)	0	0 (0)
Moose Winter Range	48	39 (-9)	0	0 (0)
Mule Deer Winter Range	339	170 (-169)	0	0 (0)
Pronghorn Winter Range	182	400 (+218)	0	0 (0)
Pronghorn Summer Range	158	121 (-37)	73	24 (-49)
Prairie Dog Towns	61	150 (+89)	12	16 (+4)
Total Number of Streams Crossed	6	6 (0)	0	0(0)
Soils and Vegetation				
Acres Disturbed During Construction	528	1,115 (+587)	105	103 (-2)
Acres Disturbed During Operation	105	279 (+174)	21	26 (+5)
Acres Not Reclaimed at Abandonment	0	167 (+167)	0	15 (+15)
Total Miles of Linear Facilities	58	91.5 (+33.5)	10.5	8.5 (-2.0)
Acres of Riparian Vegetation Disturbed				
Construction	5	22 (+17)	0	0 (0)
Operation	2	6 (+4)	0	0 (0)
Acres of Sensitive Rehabilitation Units Disturbed	158	235 (+77)	89	69 (-20)
Visual Resources				
Miles of Significant Impact	11.50	2 (-9.5)	0	0 (0)
Miles of Highly Significant Impact	14.25	4 (-10.25)	0	0 (0)
Cultural Resources				
Number of Cultural Sites Disturbed	13	12 (-1)	3	2 (-1)
Agriculture/Grazing				
Number of Crossings of Slate Creek Sheep Trail	1	0 (-1)	0	0 (0)
Land Use Conflicts				
Miles of Conflict with Seedskadee National Wildlife Refuge Management Objectives	0	4 (+4)	0	0 (0)

Note: Numbers in parentheses ( ) indicate the difference from the Proposed Action or Shute Creek Alternative.

[1]Disturbance of wildlife critical ranges would occur during construction and are considered to be short-term for the sulfur pipelines; operational disturbance (long-term) along the railroads is expected to be 50 percent of the construction disturbance.

TABLE 2-3
COMPARISON OF *MITIGATED* IMPACTS FOR POWER SUPPLY COMPONENT ALTERNATIVE

	Proposed Action	Buckhorn Alternative	Shute Creek Alternative	Northern Alternative
Wildlife and Fisheries[1]				
Acres of Critical Range Disturbed				
Elk Calving Range				
Applicants' System	0	0	0	0
UP&L System	0 (0)	0 (0)	0 (0)	0 (0)
BLM System	0 (0)	0 (0)	0 (0)	0 (0)
Elk Winter Range				
Applicants' System	194	194	194	194
UP&L System	170 (-24)	170 (-24)	194 (0)	170 (-24)
BLM System	158 (-36)	158 (-36)	158 (-36)	158 (-36)
Moose Winter Range				
Applicants' System	48	61	48	61
UP&L System	48 (0)	61 (0)	61 (+13)	61 (0)
BLM System	65 (+17)	77 (+16)	77 (+29)	48 (-13)
Mule Deer Winter Range				
Applicants' System	570	570	448	618
UP&L System	630 (+60)	606 (+36)	545 (+97)	691 (+73)
BLM System	558 (-12)	533 (-37)	448 (0)	630 (+12)
Pronghorn Winter Range				
Applicants' System	218	267	242	279
UP&L System	218 (0)	267 (0)	230 (-12)	279 (0)
BLM System	339 (+121)	388 (+121)	351 (+109)	400 (+121)
Pronghorn Summer Range				
Applicants' System	327	327	388	279
UP&L System	182 (-145)	182 (-145)	218 (-170)	182 (-97)
BLM System	218 (-109)	218 (-109)	240 (-148)	194 (-85)
Prairie Dog Towns				
Applicants' System	73	73	97	85
UP&L System	NA	NA	NA	NA
BLM System	NA	NA	NA	NA
Total Number of Streams Crossed				
Applicants' System	6	7	7	7
UP&L System	8 (+2)	8 (+1)	7 (0)	8 (+1)
BLM System	6 (0)	6 (-1)	6 (-1)	7 (0)
Soils and Vegetation[1]				
Total Acres Disturbed				
Applicants' System	1,182	1,228	1,261	1,018
UP&L System	1,152 (-30)	1,182 (-46)	1,261 (0)	970 (-48)
BLM System	1,206 (+24)	1,236 (+8)	1,248 (-13)	994 (-24)
Acres of Riparian Vegetation Disturbed				
Applicants' System	10	14	14	10
UP&L System	13 (+3)	15 (+1)	15 (+1)	13 (+3)
BLM System	12 (+2)	15 (+1)	15 (+1)	10 (0)
Acres of Sensitive Rehabilitation Units Disturbed				
Applicants' System	459	445	414	326
UP&L System	680 (+221)	680 (+235)	640 (+226)	753 (+427)
BLM System	701 (+242)	703 (+258)	733 (+319)	549 (+223)
Visual Resources[2]				
Miles of Significant Impact				
Applicants' System	0	0	0	0
UP&L System	0.75 (+0.75)	0.75 (+0.75)	0.75 (+0.75)	0.75 (+0.75)
BLM System	0 (0)	0 (0)	0 (0)	0 (0)
Miles of Highly Significant Impact				
Applicants' System	10.50	10.50	10.50	12.00
UP&L System	***7.50 (-3.00)***	10.25 (-0.25)	10.25 (-0.25)	***10.25 (-1.75)***
BLM System	***8.25 (-2.25)***	11.00 (+0.50)	11.00 (+0.50)	***11.00 (-1.00)***

TABLE 2-3 (continued)
COMPARISON OF *MITIGATED* IMPACTS FOR POWER SUPPLY COMPONENT ALTERNATIVE

	Proposed Action	Buckhorn Alternative	Shute Creek Alternative	Northern Alternative
Cultural Resources[1]				
Number of Cultural Sites Impacted				
Applicants' System	21	24	26	19
UP&L System	31 (+10)	32 (+8)	41 (+15)	30 (+11)
BLM System	N.S.	N.S.	N.S.	N.S.
Agriculture/Grazing[1]				
Number of Crossings of Slate Creek Sheep Trail				
Applicants' System	1	1	1	1
UP&L System	0 (-1)	0 (-1)	1 (0)	0 (-1)
BLM System	1 (0)	1 (0)	1 (0)	1 (0)
Land Use Plans, Controls, and Constraints[2]				
Conflicts with Existing Land Use Plans				
Applicants' System	76.5	80.5	83.0	74.5
UP&L System	77.5 (+1.5)	80.0 (-0.5)	86.5 (+3.5)	69.0 (-5.5)
BLM System	43.0 (-33.5)	45.5 (-35.0)	46.5 (-36.5)	35.5 (-39.0)

N.A. = Not applicable. These corridors were not sampled for prairie dog towns.

N.S. = Not Surveyed.

( ) = Change from the Applicant's System.

[1]Impacts to Wildlife and Fisheries, Soils and Vegetation, Cultural Resources, and Agriculture/Grazing would occur during construction.

[2]Impacts to Visual Resources and Land Use would occur during construction and operation.

difference from the Applicant's System has been identified.

- The UP&L and BLM Systems would disturb significantly more acres of sensitive rehabilitation units than the Applicant's System.
- The UP&L transmission system would disturb up to 58 percent more cultural sites than the Applicant's System.
- The BLM transmission system would have significantly less conflict with BLM's Management Framework Plan than the Applicant's System.

Employee Housing:

- The employee housing construction camp alternatives would reduce impacts on housing.
- Construction camps would disturb critical wildlife range as shown in Table 2-4. Only the West Dry Basin and Buckhorn camps would disturb no critical range. Constructions camps in close association with critical wildlife range would cause the potential for increase harassment and poaching.
- Each construction camp would require 75 acre-feet/year of groundwater for domestic supplies. This amount of groundwater is expected to be available from aquifers beneath the camp sites.
- Only the West Dry Basin camp site would have significant impacts on visual resources.
- A partial inventory for cultural resources has been conducted on the Shute Creek camp site. Four NRHP eligible sites were found. No inventories have been conducted on the other camp sites.
- The construction camp alternatives would reduce the amount of traffic on area roadways and thus the incidence of traffic accidents.
- The East Dry Basin, West Dry Basin, Big Mesa, and Buckhorn camp sites would not comply with Sublette County zoning regulations.

TABLE 2-4
COMPARISON OF *MITIGATED* IMPACTS FOR EMPLOYEE HOUSING COMPONENT ALTERNATIVE

	East Dry Basin Camp	West Dry Basin Camp	Big Mesa Camp	Buckhorn Camp	Shute Creek Camp
Wildlife and Fisheries					
Acres of Critical Range Disturbed[1]					
Mule Deer Winter Range	0	0	80	0	0
Pronghorn Winter Range	320	0	0	0	0
Pronghorn Summer Range	0	0	0	0	320
Soils and Vegetation					
Acres of Sensitive Rehabilitation Units Disturbed	0	30	0	0	60
Visual Resources					
Significance of Impact	Insignificant	Significant	Insignificant	Insignificant	Insignificant
Cultural Resources					
Number of Cultural Sites Disturbed	0	0	0	0	4
Agriculture/Grazing					
Affected Allotment	North LaBarge Common	North LaBarge Common	North LaBarge Common	Desert Canyon	Slate Creek
Land Use Plans, Controls, and Constraints					
Conflicts with County Zoning	Yes	Yes	Yes	Yes	No

[1]Impacts to wildlife critical ranges are considered to be of 20 years duration (5 years of construction and operation, 15 years to reclaim to critical range characteristics) for all construction camps.

Alternatives to the single construction camp that is part of Northwest's proposed action are the addition of other construction camps, up to a total of four. Impacts to area housing would depend on the siting alternative and the number and location of the camps. Because details on the camps have not been specified, these impacts cannot be quantified. It can be predicted, however, that the greatest reductions in housing demand would be in towns farthest from the plant sites and that the construction camps would not eliminate the significant housing impacts in Big Piney, Marbleton, and LaBarge. Housing in these towns is limited and the housing demand associated with the project would be substantially above the existing supply as well as the response capability of the housing market to provide new units.

SECTION 3

ERRATA SUMMARY

The following revisions have been made based on comments received regarding the Riley Ridge Natural Gas Project Draft EIS. The specific text changes follow. Large text additions to DEIS Appendices are shown following text changes. Revisions to tables, figures, and maps in the DEIS are included as the final section of the Errata Summary.

TEXT REVISIONS

Page	Column	Paragraph	Line	Is:	Should Be:
1-1	2	5	1	Approximately 1.876 cubic feet/day ...	Approximately 1.876 billion cubic feet/day ...
1-3	1	1	10	... 580 million cfd ...	... 576 million cfd ...
1-3	1	1	16	... older oil fields and as a transporting medium ...	... older oil fields and has been proposed as a transporting medium ...
1-12	2	P	23	... contingency plans (H_2S etc.).	... contingency plans (H_2S etc.), spill contingency plans (molten sulfur, fuel, etc.).
1-12	2	P	24	NA	Add: Livestock Operation Consultation (includes measures that will be taken within each allotment to protect or avoid destruction of improvements, to avoid livestock harassment, trailing, gathering, etc., during construction and operation and any other measures agreed to during operator consultation).
1-13	1	1	1-2	Under the Wyoming Industrial Development and Siting Act ...	Under the Wyoming Industrial Development Information and Siting Act ...
1-13	1	1	7	... of approximately $88 million.... Under proposed revisions to this act ...	of approximately $92.3 million. This figure is adjusted on a quarterly basis according to construction cost indices. Under proposed administrative guidelines to implement the Act, ...
1-13	1	1	10-11	... These revisions are intended ...	... These guidelines are intended ...
1-13	2	1 3rd bullet	5	... existing air, quality a ...	... existing air quality, a ...
1-18	1	2	4	Upon completion ...	Insert: During the drilling phase, casing is cemented in place in the bore hole. The annular space is cemented by selecting a specific type of fine grout and then pressure grouting the annular space between the casing and open hole. A cement bond electric log would provide information on the integrity of the seal. Upon completion ...
1-21	2	P	3	... riprap are shown in Table 1-22 ...	... riprap are shown in Table 1-23 ...
1-27	1	2	2	... in detail in Table 1-19 ...	... in detail in Table 1-20 ...

TEXT REVISIONS

Page	Column	Paragraph	Line	Is:	Should Be:
1-28	2	3	1-3	Northwest would construct ... to the Craven Creek plant site.	Utah Power & Light would construct ... to Northwest's Craven Creek plant site.
1-32	2	P	10	... (see Table 1-21 at the end of the chapter).	... (see Table 1-22 at the end of the chapter).
1-34	2	1	10	Table 1-20 ...	Table 1-21 ...
1-34	2	4	6	See Table 1-20 ...	See Table 1-21 ...
1-34	2	6	8	... See Table 1-20 ...	... See Table 1-21 ...
1-36	2	2	6	... (see Table 1-21 ...	... (see Table 1-22 ...
1-40	1	2	2	... are presented in Table 1-21 ...	... are presented in Table 1-22 ...
1-49	1	Heading		NO ACTION ALTERNATIVES	NO ACTION ALTERNATIVE
1-51	2	P	7-8	gas, and hazards and lack ... sour gas transport.	gas, and increased hazard of transporting sour gas large distances.
1-52	2	2	11	... too little information is avilable ...	... too little information is available ...
1-53	1	Sour Gas Treatment	9	... because it can only achieve a 98.6 percent recovery of sulfur in the tail gas	because of air quality constraints at Exxon's West Dry Basin and Big Mesa plant sites
3-14	2	P	12	... will have to seed additional ...	...will have to seek additional ...
3-17	1	1	8	Big Sandy Creek Drainage. Clear Lake ...	Big Sandy Creek drainage. These lakes were selected as tentative representatives of the aquatic habitat in the Wilderness. Clear Lake ...
3-17	1	2	5	... black-footed ferret, and peregrine falcon. No ...	... black-footed ferret, and peregrine falcon. Two additional endangered species, the humpback chub and Colorado squawfish, occur several hundred miles downstream of the Riley Ridge Project area in the Green River. No ...
3-20	1	1	9-11	... low growing willows and/or grasses. Streams in the Beaver and Dry Piney Creek drainages become turbid during moderate and heavy runoff and occasionally stop flowing. Grazing occurs ...	... low growing willows and/or grasses. During moderate and heavy runoff, Beaver and Dry Piney Creeks become turbid. Portions of these creeks occasionally stop flowing during the drier parts of the year (August - October). Grazing occurs ...

TEXT REVISIONS

Page	Column	Paragraph	Line	Is:	Should Be:
3-20	2	1	4	... man-caused changes in its habitat. In the well field, Colorado River cutthroat of varying genetic purity are found in Black Canyon Creek, Fogarty Creek, Pine Grove Creek, South Beaver Creek, Middle Beaver Creek, North Beaver Creek, Coal Creek, Trail Ridge Creek, South Piney Creek, Fish Creek, Porcupine Creek, and Spring Creek (Map 3-1). Rock Creek ...	... man-caused changes in its habitat. Pure Colorado River cutthroat trout transplants have been made into Pine Grove Creek, Fogarty Creek, and Black Canyon Creek, while Colorado River cutthroat trout of varying purity are found in South Beaver Creek, Middle Beaver Creek, Coal Creek, Trail Ridge Creek, South Piney Creek, Fish Creek, Porcupine Creek, and Spring Creek. Rock Creek ...
3-29	2	5	3	... Wyoming. The air quality study area is bounded by the ...	... Wyoming. The air quality study area is defined by the natural airshed boundary and is bounded by the ...
3-34	2	1	2	... often cause the soil to freeze. This is an important ... to prevent damage. Most ...	... often cause the soil to freeze. Most ...
3-73	2	6		NA	Add: NO ACTION ALTERNATIVE The affected environment for this alternative is the same as described in the Proposed Action for all resources.
4-24	1	P	6-7	... supports a hybrid Colorado River cutthroat trout fishery and ...	... supports a transplanted population of pure Colorado River cutthroat trout from North Beaver Creek and ...
4-24	1	1	16-18	... salt water flow encountered during the drilling of an oil well; as a result most of the 1,150 cutthroat trout stocked in the river were killed (Remmick 1981). Loss ...	... brine and oil from an existing well. This incident resulted in the loss of 1,150 cutthroat trout as well as countless other aquatic organisms (Remmick 1981). Loss ...
4-24	2	3	8	... Piney Creek, Dry Piney Creek, and their tributaries.	... Piney Creek and Dry Piney Creek tributaries.
4-28	1	P	6	... be short term and localized.	... be short term and localized. The cumulative effects, however, of some 100 streams crossings by roads and pipelines on increased sedimentation in the more downstream reaches of streams such as Fish Creek, South Piney Creek, Beaver Creek, and Fogarty Creek could be significant. This may result in a reduction of fish carrying capacity because of losses in food organisms, over-wintering habitat, spawning habitat, etc.

TEXT REVISIONS

Page	Column	Paragraph	Line	Is:	Should Be:
4-29	1	P	1	... H_2S pipeline rupture would result ...	... sour gas pipeline rupture would result ...
4-29	2	2	10	... increase salinity at Imperial Dam by 1 milligram/liter ...	... increase salinity at Imperial Dam by 1.9 milligram/liter ...
4-30	1	2	5	... impact.	... impact. A "no affect" decision has been issued relative to the humpback chub and Colorado squawfish. The biological opinion issued by the U.S. Fish and Wildlife Service as a result of the consultation process will specify the mitigation measures to be carried out by the applicants with regard to all threatened and endangered species.
4-33	2	2	6	... quarter to ... person would ...	...quarter to... person could ...
4-33	2	2	8	... of the well a person would ...	... of the well a person could ...
4-34	2	Item 4		Changes in pH of wilderness lakes by acid precipitation to the extent that productivity and health of aquatic ecosystems were reduced, i.e., below 6.0.	Any decrease in the pH of lakes in Class I areas such as the Bridger Wilderness equal to or greater than 0.1 (the reliable limit of measurement). This criteria is based on Forest Service Manual 2100, Chapter 2120, Section 2120.5.
4-36	2	2	1-2	*Groundwater*. Similar impacts could occur as ...	*Groundwater*. If proper well completion and abandonment procedures are not followed, similar impacts could occur as ...
4-36	2	4	1	Groundwater. No impacts would result from plant ...	Groundwater. No impacts would result to aquifers containing less than 10,000 milligrams/liter TDS from plant ...
4-36	1	4	9	... raod maintenance, ...	... road maintenance, ...
4-37	1	2	5	No significant impacts ... have been identified.	A significant decrease in pH ranging between 0.09 and 0.17 could occur in Clear Lake (south).
4-37	2	4	12	... no sinificant ...	... no significant ...
4-38	1	3	12	... California border) by 1 milligram/liter ...	... California border) by 1.9 milligram/liter ...

TEXT REVISIONS

Page	Column	Paragraph	Line	Is:	Should Be:
4-39	2	P	1	... down to 6.0 in high altitude, low buffered lakes (acid deposition significance criterion).	... in high altitude, low buffered lakes down to 6.0 for fisheries and a decrease in pH equal to or greater than 0.1 for water quality (acid deposition significance criteria).
4-39	2	3	10	... impacts could occur ... in air quality.	... impacts could occur in air quality. Forest Service policy (Manual 2100, Chapter 2120, Section 2120.5) states that "until sufficient data exists for the Region [2] to identify specific LOCs [level of acceptable change], the Region is defining the LOC for all air quality related values except visibility to be any measureable impact from the baseline condition".
4-42	1	P	2-11	... more representative and are in this analysis. Actual off-site data are considered more representative because the terrain features where the data were collected (Kemmerer Coal, see Map 3-5) are similar to the terrain features at the Riley Ridge Project sites. Furthermore, assumed worst-case meteorology has somewhat arbitrarily assumed values for the persistence of wind direction, wind speed, and atmospheric stability. Actual off-site data do not require such persistence assumptions. Predicted concentrations ...	... more representative and are are in this analysis for reasons stated below. First, the off-site data collection point (Kemmerer Coal Map 3-5) is located in similar terrain as the proposed Riley Ridge sites. Both Kemmerer Coal and Riley Ridge are located along the east slope of higher terrain. Second, the Kemmerer wind rose is consistent with the majority of other wind roses in the area. This suggests there is regionality in these data. Third, modeling using the sequential Kemmerer data removes the necessity of making assumptions regarding the frequency and persistence of conditions from the assumed worst-case data set. Since many of the meteorological phenomena which lead to high air quality impacts are regional in character (strong inversion, light winds, etc.), the Kemmerer data can provide a much more representative data base than arbitrary worst-case assumptions. Predicted concentrations ...
4-45/ 4-46	2 1	4 P	15 1-3	When compared to nitric and sulfuric acid ... emission rate).	Delete

TEXT REVISIONS

Page	Column	Paragraph	Line	Is:	Should Be:
4-47	1	P	6	... significance criterion 6.0 presented earlier.	... significance criterion of 6.0 presented earlier for fisheries, but the predicted decrease in pH of between 0.09 and 0.17 would exceed the significance criteria for water quality. These predictions are based upon the best information available at the time the DEIS was prepared. The addition of field data collected through implementation of the Air Quality Related Values Action Plan (i.e., snowpack and precipitation chemistry, soil buffering capacity, and lake stratification) will greatly improve the prediction capabilities of lake acidity.
4-48	1	1	1	Although the long-term effects of acid deposition in the Bridger Wilderness Area cannot be estimated at this time with high confidence, based on existing ...	Although the long-term effects of acid deposition in the Wind River Range cannot be determined at this time due to inadequate information on the chemistry and biology of the lakes and streams, based on existing ...
4-48	1	1	6	... Riley Ridge Project is small enough to be neutralized ... This is ...	... Riley Ridge Project is expected to be small enough to be neutralized. This is ...
4-54	1	1	13	... and ... vegetation.	add: Although CO_2 emissions would exceed SO_2 and NO_x emissions, no impacts to vegetation are anticipated from CO_2 concentrations.
4-58	1 2	1 P	3-5 1-3	... structures. In addition ... visible	... structures. (Delete)
4-93	1	2	4	... Proposed Action (see Table 4-36).	... Proposed Action (see Table 4-36). Impacts to water quality would be significant as described for the Proposed Action.
4-108	2	2	8	... 0.07 to 0.13. The ...	... 0.07 to 0.13. This would be a significant impact to water quality. The ...
4-112	1	1	6-9	... the Opal Cutoff. For this reason, ... plants.	... the Opal Cutoff.
4-121	1	P	4	... 50 gpm... Northwest plant. Other impacts ...	... 50 gpm ... Northwest plant. A significant decrease in pH ranging between 0.10 and 0.20 would occur in Clear Lake (south). Other impacts ...

TEXT REVISIONS

Page	Column	Paragraph	Line	Is:	Should Be:
4-125	1	2	8	... 0.10 to 0.20. The ...	... 0.10 to 0.20. This would be a significant impact to water quality. The ...
			10	Therefore, ... is expected in all ...	Therefore, ... is expected to sensitive fish in sensitive high altitude lakes in all ...
4-131	2	S-1	3-5	Measure: Temporary worker camps near each approved plant site will be required to house construction workers. Sites for the worker camps will be selected from those sites analyzed in the EIS, if possible.	Measure: Temporary worker camps will be required to house construction workers. Housing provided shall be consistent with Wyoming Industrial Siting Administration Permit conditions.
4-133	WF-8		13	... (within ½ mile) ...	... (within 1 mile) ...
4-133	2	WF-11	2-7	... conducted during the fall low flow period. Major crossings ... and Use Plan.	... conducted during the fall low flow period.
4-133	2	WF-11	12-18	... construction. Constructing the lines ... of trout.	construction.
4-134	1	WF-13	1-7	Measure: The companies will be quired to develop and implement a sediment monitoring plan to be approved by the Authorized Officer. The specific streams recommended for monitoring are Trail Ridge Creek, South Beaver Creek, and South Piney Creek just below its confluence with Coal Creek.	Measure: The companies will be required to implement the fisheries and surface water quality monitoring program appended to the FEIS. Stream sampling locations will include the four established stations in the well field on Fish Creek, Beaver Creek, Pine Grove Creek, and Black Canyon Creek as well as others that may be specified by the Authorized Officer.
4-134	2	H-3	1-17	Measure: Companies will develop community contingency and evacuation plans for Calpet, LaBarge, Big Piney, and Marbleton in coordination with the public safety organizations including community civil defense organizations, sheriff, highway patrol, and fire departments, etc. for accidental release of H_2S and in accordance with appropriate Federal and state regulations. Plans will include early warning and mass alert systems.	Measure: Companies will develop community contingency and evacuation plans in coordination with the public safety organizations including community civil defense organizations, sheriff, highway patrol, fire departments, livestock operators residing in the area, and other human inhabitants, etc., for accidental release of H_2S and in accordance with appropriate federal and state regulations. Plans will include early warning and mass alert systems, and human evacuation procedure. Communities involved will be Marbleton, Big Piney, Western Camp, Dry Piney Camp, Calpet, and LaBarge. Outlying areas include all other permanent residences within

Page	Column	Paragraph	Line	Is:	Should Be:
Continued from 4-134.					
					the project area or area of influence, and temporary human occupancy areas (i.e., Fontenelle Recreation Area).
				Effectiveness: Community evacuation measures would be effective in alerting the populations of communities near the sour gas trunk lines of possible H_2S hazards; however, they would not eliminate the possibility of some people being exposed to significant or lethal levels of H_2S.	Effectiveness: Community and outlying area contingency and evacuation measures would be an effective means of insuring that an organized, systematic approach towards alerting and evacuating the populations of the communities and outlying residence occurs. The contingency and evacuation plans will address possible H_2S hazards and describe the procedure that will be used to protect human life. These plans would include concern for any receptor within the area of influence of the well field, trunk lines, or processing plants. The measure, however, would not eliminate the possibility of some people being exposed to significant or lethal levels of H_2S.
4-134	2	H-4		Measure: For any section of sour gas trunk lines less than 5 miles from Big Piney, Calpet, and LaBarge, block valve spacing will be between 1 and 2.5 miles. Final valve spacing will be determined by the Authorized Officer.	Measure: No sour gas trunk line will be located closer than 1 mile to a populated area or sensitive receptor as identified on Map 2-1 in the FEIS. The applicants must use the best available engineering design (i.e., alignment, block valve type and spacing, pipe grade, etc.), best construction techniques (i.e., pipe depth, hydrostatic testing, etc.), and monitoring plans (i.e., surveillance, warning signs, etc.) as approved by the Authorized Officer to minimize both the probability of rupture and radius of exposure in the event of an accidental pipeline release of sour gas. A variance from the 1-mile distance may be granted by the Authorized Officer based on detailed site-specific analysis that would consider meteorology, topography, and special pipeline design and/or construction measures. This analysis would ensure that populated areas and sensitive receptors would not be exposed to an increased level of risk.

Page	Column	Paragraph	Line	Is:	Should Be:
Continued from 4-134					
				Effectiveness: This measure will reduce the possibility of exposure to both discomfort and lethal levels of H_2S in the event of a trunk line rupture. The annual risk of lethal exposure could be reduced to effectively zero (less than 0.0001) in LaBarge and by up to 25 percent in Calpet, depending on alternative and valve spacing. The annual risk of discomfort exposure could be reduced to effectively zero in LaBarge and by up to 45 percent in Calpet, depending on alternative and valve spacing. See Appendix C.6 for a complete discussion of the effectiveness of this mitigation measure.	Effectiveness: This measure will reduce both the probability of a rupture and minimize the extent of exposure for both discomfort and lethal levels of H_2S to sensitive receptors in the event of a sour gas pipeline rupture. The probability of rupture can be reduced by such measures as warning signs, burial depth, pipe thickness and grade, while such measures as block valve types and spacing and pipeline alignment would minimize the exposure radius from the point of rupture in the event of an accident. See Appendix C.6 of the DEIS for a discussion of the effectiveness of block valve spacing and resultant exposure distances.
4-135		Addition of Measure H-6		NA	H-6 Measure: All applicants will be required to have a gas-assisted flare mechanism at the plant site to flare the non-combustible sour gas in the event of a plant upset. Effectiveness: In the event of a total plant shutdown, gas must be flared for an interim period until the wells can be shut-in. Since the raw sour gas is not combustible, a gas-assisted flare will be necessary. This would minimize the impacts to nearby sensitive receptors. Application: This measure would be applicable to all applicants at all siting locations.
4-136	1	SV-3	5	... root systems. (Not yet committed.)	... root systems.
4-136	2	P	5	... crushed or clipped shrubs ...	... some crushed or clipped shrubs ...
4-136	2	P	8	... of wildlife habitat.	Delete.
4-137	1	V-4	4	... structures. However, if the authorized officer ...	... structures. If the Authorized Officer ...
4-137	1	V-5	1	Measure: Where possible within the analyzed ...	Measure: Where directed by the Authorized Officer within the analyzed ...

TEXT REVISIONS

Page	Column	Paragraph	Line	Is:	Should Be:
4-140	1	5	2	... northward in the Western Overthrust Belt, those ...	... northward, those ...
B-2	1	1	4	Project.	Project. These procedures are somewhat general; measures which are more specific to each applicant and project component will be contained in the final Construction and Use (CU) Plan.
B-8	See text addition at the end of Errata Summary.				
B-12	See text addition at the end of Errata Summary.				
P-4	-	-	7	NA	Add: Roberto Costales - Cultural Resources
B-18 B-19	2 1	6 P	5 1-2	Exceptions to this requirement would be small structures that are not readily visible from a distance of approximately 0.25 mile, or structures ...	Exceptions to this requirement would be determined on a case-by-case basis by the Authorized Officer because of varying levels of sensitivity, or structures ...
B-22	1	P	2	... sites, and watershed areas should be avoided ...	... sites, sensitive visual areas and watershed areas should be avoided ...
B-26	1	2	15-18	... developed. The Erosion Control, Revegetation, and Restoration Guidelines and CU Plan will be implemented under the direction of the appropriate agency official.	... developed. The CU Plan will be approved by the Authorized Officer and implemented by the companies.
B-26	1	5	1	General erosion control and restoration measures ...	General erosion control and restoration guidelines ...
B-26	1	5	11	Use of Biochemicals	Use of Chemicals
B-26	2	4	4-5	... will be piled and later shredded and chipped for use in ...	... will be piled for later use in ...
B-27	1	Bullet 4	1	Topsoil is removed from the trench area by double-ditching (i.e., windrowed separately, protected, and replaced last during backfilling).	Topsoil is removed from the trench area, windrowed separately, protected, and replaced last during backfilling.
B-27	2	Bullet 5	4	... preconstruction conditions so that they will function as originally intended.	... preconstruction conditions.
B-28	2	2	6	... will follow recommendations and directions of local ...	... will consider recommendations and directions of local ...

TEXT REVISIONS

Page	Column	Paragraph	Line	Is:	Should Be:
B-29	1	5	(Heading)	Use of Biochemicals	Use of Chemicals
B-29	2	3	1-2	To maintain stream bank stability, preserve stream channel and flood plains effectiveness, and minimize ...	To maintain stream bank stability, preserve the hydrologic characteristics of the existing stream channel and flood plain, and minimize ...
D-3	2	NA			Add: Sublette and Lincoln County agencies could pass zoning regulations that could restrict the construction of new residences or businesses near sour gas pipelines or approved sour gas pipeline rights-of-way. This would help keep potential health and safety impacts at as low a level as possible during the operational life of the pipelines.
E-1	2	1	After Item 11)	NA	12) Injection wells should have cement bond logs to insure that fresh water aquifers are protected from upward movement of wastewater through channels outside the casing. 13) Disposal wells need a continuous monitoring program for injection volume and annulus pressure.
E-4	1	NA	1	AIR QUALITY MONITORING	AIR QUALITY RELATED VALUES ACTION PLAN

Note: P = partial paragraph
NA = not applicable

TEXT ADDITIONS

ADDITION TO APPENDIX B.2 OF THE DEIS, FEDERAL REGULATIONS: TERMS AND CONDITIONS

(Insert for Page B-8, Column 2, Line 23)

Subpart 2883 - Administration of Rights Granted

§ 2883.1-4 Liability.

(a) Except as provided in paragraph (f) of this section holders shall be fully liable to the United States for any damage or injury incurred by the United States in connection with the use and occupancy of the right-of-way or permit area.

(b) Except as provided in paragraph (f) of this section, holders shall be held to a standard of strict liability for any activity within a right-of-way or permit area which the authorized officer determines, in his discretion, presents a foreseeable hazard or risk of damage or injury to the United States. The activities and facilities to which such standard shall apply shall be specified in the right-of-way grant or temporary use permit. Strict liability shall not be imposed for damage or injury resulting primarily from an act of war or the negligence of the United States. To the extent consistent with other laws, strict liability shall extend to costs incurred by the United States for control and abatement of conditions, such as fire or oil spills, which threaten lives, property or the environment, regardless of whether the threat occurs on areas that are under Federal jurisdiction. Stipulations in right-of-way grants and temporary use permits imposing strict liability shall specify a maximum limitation on damages which, in the judgment of the authorized officer, is commensurate with the foreseeable risks or hazards presented. The maximum limitation shall not exceed $1,000,000 for any one event, and any liability in excess of such amount shall be determined by the ordinary rules of negligence of the jurisdiction in which the damage or injury occurred.

(c) In any case where strict liability is imposed and the damage or injury was caused by a third party, the rules of subrogation shall apply in accordance with the law of the jurisdiction in which the damage or injury occurred.

(d) Except as provided in paragraph (f) of this section, holders shall be fully liable for injuries or damages to third parties resulting from activities or facilities on lands under Federal jurisdiction, in accordance with the law of the jurisdiction in which the damage or injury occurred.

(e) Except as provided in paragraph (f) of this section, holders shall fully indemnify or hold harmless the United States for liability, damage or claims arising in connection with the use and occupancy of right-of-way or permit areas.

(f) If a holder is a State or local government, or agency or instrumentality thereof, it shall be liable to the fullest extent its laws allow at the time it is granted a right-of-way grant or temporary use permit. To the extent such a holder does not have the power to assume liability, it shall be required to repair damage or make restitution to the fullest extent of its powers at the time of any damage or injury.

(g) All owners of any interest in, and all affiliates or subsidiaries of any holder of a right-of-way grant or temporary use permit, except for corporate stockholders, shall be jointly and severally liable to the United States in the event that a claim cannot be satisfied by a holder.

(h) Except as otherwise expressly provided in this section, the provisions in this section for a remedy is not intended to limit or exclude any other remedy.

(i) If the right-of-way grant or temporary use permit is issued to more than one holder, they shall be jointly and severally liable under this section.

TEXT ADDITIONS

ADDITION TO APPENDIX B.3 OF THE DEIS, CURRENT LEASE STIPULATIONS ON OCCUPANCY

(Insert on Pages B-10 to B-12)

Lease Locations	Special Stipulations
T29N, R115W Sec. 7, Lots 1, 2, 3, 4, E½, E½W½ Sec. 8, all Sec. 17, W½ Sec. 18, Lots 1, 2, 3, 4, E½, E½W½	(25) (33) No surface occupancy that will alter wilderness until ES is prepared and propriety determined.
T30N, R115W Sec. 13, Lots 1, 2, W½NE¼ Sec. 24, Lots 1, 2, 3, 4, W½E½	(25) (33)
T29N, R115W Sec. 5, all Sec. 6, Lots 1, 2, 3, 4, N½NE¼, E½W½, E½SE¼ T30N, R115W Sec. 30, Lots 1, 2, 3, 4, E½, E½W½ Sec. 31, Lots 1, 2, 3, 4, E½, E½W½	(25) (33)
T30N, R115W Sec. 25, NW¼	(25) (33)
T30N, R115W Sec. 12, Lots 1, 2, 3, 4, W½E½, SW¼	(25) (33)
T30N, R115W Sec. 13, N½SW¼ Sec. 24, N½SW¼ Sec. 25, Lot 2	(25) (33)
T30N, R115W Sec. 1, Lots 1, 2, 3, 4, 5, 6, 7, SW¼NE¼, S½NW¼, SW¼, W½SE¼	(25) (33)
T31N, R115W Sec. 36, all	
T30N, R115W Sec. 2, SE¼ Sec. 11, NE¼ Sec. 12, NW¼	(25)
T30N, R115W Sec. 3, Lots 1, 2, S½NE¼ Sec. 10, NE¼, E½SE¼ Sec. 23, E½ Sec. 26, E½, SW¼ Sec. 27, E½ Sec. 35, all	(25) (33)
T30N, R115W Sec. 13, NW¼, S½SW¼	(25)

ADDITION TO APPENDIX B.3 OF THE DEIS, CURRENT LEASE STIPULATIONS ON OCCUPANCY (continued)
(Insert on Pages B-10 to B-12)

Lease Locations	Special Stipulations
Sec. 14, SW¼ Sec. 23, NW¼ Sec. 24, NW¼, S½SW¼ Sec. 25, Lots 1, 3, 4, W½E½, SW¼	
T29N, R115W Sec. 3, all Sec. 4, E½, NW¼, N½SW¼, SE¼SW¼	(25)
T29N, R115W Sec. 6, S½NE¼, W½SE¼ Sec. 31, NE¼	(25)
T30N, R115W Sec. 2, Lots 1, 2, 3, 4, S½N½, SW¼ Sec. 3, SE¼ Sec. 10, W½SE¼ Sec. 11, W½, SE¼ Sec. 15, E½ Sec. 22, E½ Sec. 23, SW¼ Sec. 26, NW¼ T31N, R115W Sec. 35, NE¼	(25) (34) No surface occupancy Middle Piney summer home area and Sacajawea campground. (35) Lease area contains critical habitat for certain wildlife species. Proposed activities will be discussed before entry.
T30N, R115W Sec. 14, NE¼, S½SE¼	(25)
T30N, R115W Sec. 14, NW¼, N½SE¼ Sec. 22, W½ Sec. 27, W½ Sec. 34, all Sec. 36, Lots 1, 2, 3, 4, W½E½, W½	(25) (33)
T30N, R115W Sec. 16, all Sec. 20, all Sec. 21, all Sec. 29, all Sec. 33, all	(24) (25) (35) (36) No surface occupancy because high surface runoff, slope failure, and proposed bighorn sheep range.
T30N, R115W Sec. 3, Lots 3, 4, S½NW¼, SW¼	(25) (34)
T29N, R115W Sec. 19, Lots 1, 2, 3, 4, E½, E½W½ Sec. 20, W½ Sec. 29, W½ Sec. 30, Lots 1, 2, 3, 4, E½, E½W½	(24) (25) (35) (37) No surface occupancy allowed within 100 feet of centerline of the Lander-Oregon Trail in Lots 3, 4, E½SW¼, W½SE¼, Sec.19.

TEXT REVISIONS

ADDITION TO APPENDIX B.3 OF THE DEIS, CURRENT LEASE STIPULATIONS ON OCCUPANCY (continued)

(Insert on Pages B-10 to B-12)

Lease Locations	Special Stipulations
T29N, R116W Sec. 24, all	
T29,R115W Sec. 9, all Sec. 10, all	(25) (38) Surface use restriction due to steep side slopes and adjacent to riparian zones.
T30N, R115W Sec. 5, Lots 1, 2, 3, 4, S½N½, S½ Sec. 8, Lots 1, 2, 3, 4, E½, N½NW¼, SE¼SW¼ Sec. 9, W½	(25) (39) Surface use restrictions due to steep side slopes, riparian zone, avalanche hazard, high surface runoff.
T30N, R115 W Sec. 9, E½ Sec. 10, W½ Sec. 17, all Sec. 28, all Sec. 32, all	(25) (40) Surface use restrictions due to steep access, riparian zone, also area of proposed planting of mountain sheep.

Agency	Nature of Action	Authority	Project Feature
PAGE 1-6, TABLE 1-1:			
Is:			
Department of the Army U.S. Army Corps of Engineers	Issue (Section 404) individual permits(s) for placement of dredged or fill material in waters of the United States or their adjacent wetlands	Section 404 of Federal Water Pollution Control Act Amendment of 1972, 33 U.S.C. Section 1344; 33 CFR Parts 323, 325	River or stream crossing for access roads, water supply pipelines, product pipelines, etc.
	Issue (Section 10) permit(s) for structures or work in or affecting navigable waters of the United States	Section 10 of the Rivers and Harbor Act of 1899; 33 U.S.C. Section 403; 33 CFR Parts 320-322, 329	Water diversion facilities, dams, wells, and construction resulting in alterations to water course
Should Be:			
Department of the Army U.S. Army Corps of Engineers	Issue (Section 404) individual permits(s) for placement of dredged or fill material in waters of the United States or their adjacent wetlands	Section 404 of *Clean Water Act, 33 U.S.C. Section 1344*	River or stream crossing for access roads, water supply pipelines, product pipelines, etc.
	(DELETED)		
PAGE 1-7, TABLE 1-1:			
Is:			
Federal Energy Regulatory Commission	Certificate of Public Convenience and Necessity	Section (7)c of the N Policy Act of 1978; 18 CFR Section 2.102; Section 110 of the Natural Gas Policy Act of 1978; FERC Order No. 94	Recovery of the costs for treatment plant;
Department of Transportation			
.			
.			
.			
Research and Special Programs Administration Office of Pipeline Safety Operations	Regulates safe construction and operation of gas pipelines	18 U.S.C. Section 834; 49 U.S.C. Section 1655; 49 CFR Part 195	Pipelines
.			
.			
.			
Environmental Protection Agency	Issue Resource Conservation and Recovery Permit for treatment, storage, or disposal of hazardous waste	Section 3005 of Resource Conservation and Recovery Act of 1976, 42 U.S.C. Section 6925; 40 CFR Parts 122, 124, 260-267	Hazardous waste disposal
	Register generators of hazardous waste	Section 3002 of Resource Conservation and Recovery Act of 1976, 42 U.S.C Section 6922, 40 CFR Parts 122, 262	Hazardous waste generation
Should Be:			
Federal Energy Regulatory Commission	Certificate of Public Convenience and Necessity	Section (7)c of the Natural Gas Policy Act of 1978; 18 CFR Section 2.102; Section 110 of the Natural Gas Policy Act of 1978; FERC Orders Nos. 94 and 94-A	Recovery of the costs for treatment plant; sales gas pipelines used to transplant natural gas in interstate commerce
Department of Transportation			
.			
.			
.			
Research and Special Programs Administration Office of Pipeline Safety Operations	Regulates safe construction and operation of gas pipelines	18 U.S.C. Section 834; 49 U.S.C. Section 1655; 49 CFR Parts 191, 192, and 195	Pipelines
.			
.			
.			

REVISIONS TO TABLES, FIGURES, AND MAPS

Agency	Nature of Action	Authority	Project Feature
PAGE 1-7, TABLE 1-1:			
Should Be:			
Environmental Protection Agency	Issue Resource Conservation and Recovery Permit for treatment, storage, or disposal of hazardous waste	Section 3005 of Resource Conservation and Recovery Act of 1976, 42 U.S.C. Section 6925; 40 CFR Parts 122, 124, 260-267	Hazardous waste disposal
	Register generators of hazardous waste	Section 3002 of Resource Conservation and Recovery Act of 1976, 42 U.S.C Section 6922, 40 CFR Parts 122, 262	Hazardous waste generation
	Approval to dispose of produced water	Safe Drinking Water Act, Section 421, 1422, and 1425	Well field
	Approval to dispose of waste water	Safe Drinking Water Act, 40 CFR 122, 123, 124, and 125	Treatment plant
PAGE 1-8, TABLE 1-2			
Is:			
Wyoming Department of Environmental Quality Water Quality Division	Issue National Pollution Discharge Elimination System (NPDES) permit for plant site runoff	Wyoming Environmental Quality Act, W.S. 35-11-301	Treatment Plants
	Issue NPDES permit for construction runoff at railroad spur	Wyoming Environmental Quality Act, W.S. 35-11-301	Railroad line and spur
	Approval of wastewater evaporation pond	Wyoming Environmental Quality Act, W.S. 35-11-301	Treatment plants
	Approval of plant site runoff retention pond	Wyoming Environmental Quality Act, W.S. 35-11-301	Treatment plants
	Approval of sewage treatment plant (groundwater pollution control permit)	Wyoming Environmental Quality Act, W.S. 35-11-301	Treatment plants
	Approval of water supply for plant personnel	Wyoming Environmental Quality Act, W.S. 35-11-301 (a)(v) and 35-11-302	Treatment plants
	Approval of spill prevention control and countermeasure plan	Wyoming Environmental Quality Act, W.S. 35-11-301	Treatment plants
Should Be:			
Wyoming Department of Environmental Quality Water Quality Division	Issue National Pollutant Discharge Elimination System (NPDES) permit for plant site runoff	Wyoming Environmental Quality Act, W.S. 35-11-301	Treatment plants
	Issue permits for the construction of wastewater evaporation pond, plant site runoff retention pond, sewage treatment plant	Wyoming Environmental Quality Act, W.S. 35-11-301	Treatment plants
	Approval of water supply for plant personnel if 20 or more service connections are required.	Wyoming Environmental Quality Act, W.S. 35-11-301	Treatment plants
	Issue a groundwater pollution control permit for the underground injection of plant process water	Wyoming Environmental Quality Act, W.S. 35-11-301	Treatment plants

REVISIONS TO TABLES, FIGURES, AND MAPS

Agency	Nature of Action	Authority	Project Feature
PAGE 1-8, TABLE 1-2:			
Is:			
Wyoming State Engineer's Office	Approval for construction or enlargement of reservoir	Wyoming Industrial Development Information and Siting Act, W.S. 35-12-107	...
	Approval of change of use and point of diversion—inundated rights	Wyoming Industrial Development Information and Siting Act, W.S. 35-12-107	
Should Be:			
Wyoming State Engineer's Office	Approval for construction or enlargement of reservoir	Wyoming Industrial Development Information and Siting Act, W.S.	...
	Approval of change of use and point of diversion—inundated rights	Wyoming Industrial Development Information and Siting Act, W.S. *41-26 through 41-46*	
PAGE 1-9, TABLE 1-2			
Is:			
(Wyoming State Engineer's Office)	Review of water supply and water yield analysis	Wyoming Industrial Development Information and Siting Act, W.S. 35-12-107	...
	Issue permits to appropriate groundwater, statement of completion and description of well including produced water for beneficial use	"	
	Approval of water pipeline	"	
	Issue reservoir permit—raw water holding pond	"	
	Issue reservoir permit—wastewater evaporation pond	"	
	Issue reservoir permit—plant site runoff retention pond	"	
	Issue temporary water rights for construction permits to appropriate surface water	"	
Should Be:			
(Wyoming State Engineer's Office)	Review of water supply and water yield analysis	Wyoming Industrial Development Information and Siting Act, W.S. 35-12-107	...
	Issue permits to appropriate groundwater, statement of completion and description of well including produced water for beneficial use	W.S. 41-121 to 41-147	
	Approval of water pipeline	W.S. 41-26 to 41-46	
	Issue reservoir permit—raw water holding pond	Wyoming Industrial Development Information and Siting Act, W.S. 35-12-107	
	Issue reservoir permit—wastewater evaporation pond	Wyoming Industrial Development Information and Siting Act, W.S. 35-12-107	
	Issue reservoir permit—plant site runoff retention pond	Wyoming Industrial Development Information and Siting Act, W.S. 35-12-107	
	Issue temporary water rights for construction permits to appropriate surface water	W.S. 41-4, 41-10	

Agency	Nature of Action	Authority	Project Feature
PAGE 1-9, TABLE 1-2:			
Is:			
Wyoming Oil and Gas Commission	*Authority to allow or prohibit flaring or venting of gas	Wyoming Oil and Gas Act W.S. 30-5-102	Well Field
	*Approval of wastewater disposal	Wyoming Oil and Gas Act, W.S. 30-5-102	Well Field
Should Be:			
Wyoming Oil and Gas Commission	*Authority to allow or prohibit flaring or venting of gas	Wyoming Oil and Gas Act, W.S. 30-5-102	Well Field
	[Delete]		
PAGE 1-10, TABLE 1-2			
Is:			
Wyoming Industrial Siting Administration	Issue Industrial Facility Siting permit	Wyoming Industrial Development and Siting Act, W.S. 35-12-101 through 35-12-121; Wyoming 1975 Session Laws, Chapter 169, as amended 1977, and 1981.	Treatment plants and appurtenant components
	Issue a ten-year plan for industrial facility applicants	Wyoming Industrial Development and Siting Act W.S. 35-12-101 through 35-12-121; Wyoming 1975 Session Laws, Chapter 169, as amended 1977, and 1981.	Treatment plants and appurtenant components
	Information application	Wyoming Industrial Development Siting Act W.S. 35-12-101 through 35-12-121; Wyoming 1975 Session Laws, Chapter 169, as amended 1977, and 1981.	Treatment plants and appurtenant components
	Issue certificate of insufficient jurisdiction	Wyoming Industrial Development and Siting Act W.S. 35-12-101 through 35-12-121; Wyoming 1975 Session Laws, Chapter 169, as amended 1977, and 1981.	Treatment plants and appurtenant components
Should Be:			
Wyoming Industrial Siting Administration	Issue Industrial Facility Siting permit	Wyoming Industrial Development and Siting Act, W.S. 35-12-101 through 35-12-121; Wyoming 1975 Session Laws, Chapter 169, as amended 1977, and 1981.	Treatment plants and appurtenant components
	[Delete]		
Is:			
Wyoming Public Service Commission	Certificate of Public Convenience and Necessity	Wyoming Statutes 1977 and Wyoming Administrative Procedure Act, W.S. 37-1-101, 37-1-102, 37-1-116, 37-2-117, 37-2-119, 37-2-120, 37-2-122, 37-2-205 through 207, 37-2-210 through 212, 37-3-114, 37-6-101 through 107	...
Should Be:			
Wyoming Public Service Commission	Certificate of Public Convenience and Necessity	Wyoming Statutes 1977 and Wyoming Administrative Procedure Act, W.S. 37-1-101, 37-1-102, 37-1-116, 37-2-117, 37-2-119, 37-2-120, 37-2-122, 37-2-205 through 207, 37-2-210 through 212, 37-3-114, 37-6-101 through 107 Title 49, CFR Parts 191, 192, and 195 of the Department of Transportation regulations for plants and pipelines.	...

REVISIONS TO TABLES, FIGURES, AND MAPS

PAGE 1-17, TABLE 1-5:
Is:

	American Quasar	...	Exxon Corporation	Northwest Pipeline	...	Totals
By-Products	1,960 TPD[1] sulfur 600-700 million cfd CO_2 He		2,240 TPD[1] sulfur 660 million cfd CO_2 N_2 He	757 TPD[1] sulfur 260 million cfd CO_2 N_2 He		4,957 TPD[1] sulfur 1,520-1,620 million cfd CO_2
Plant Facilities	...		...	-Railroad for sulfur transport to Opal -Sour gas line to plant -Access roads, transmission lines, communication lines, water wells -Plant -Sales gas line to Trailblazer Pipeline -CO_2 pipeline		None

Should Be:

	American Quasar	...	Exxon Corporation	Northwest Pipeline	...	Totals
By-Products	1,960 TPD[1] sulfur 800 million cfd CO_2 He		2,240 TPD[1] sulfur 800 million cfd CO_2 N_2 He	757 TPD[1] sulfur 270 million cfd CO_2 N_2 He		4,957 TPD[1] sulfur 1.87 billion cfd CO_2
Plant Facilities	...		...	-Railroad for sulfur transport to Opal -Sour gas line to plant -Access roads, transmission lines, communication lines, water pipeline from the Green River -Plant -Sales gas line to existing Northwest pipeline -CO_2 pipeline		None

REVISIONS TO TABLES, FIGURES, AND MAPS

PAGE 1-42, FIGURE 1-15
Is:

	Proposed Action	Buckhorn Alternative	Shute Creek Alternative	Northern Alternative
Employee Housing				
East Dry Basin Camp	●			
West Dry Basin Camp	●	●		
Big Mesa Camp	●			●
Buckhorn Camp			●	
Shute Creek Camp			●	

Should Be:

	Proposed Action	Buckhorn Alternative	Shute Creek Alternative	Northern Alternative
Employee Housing				
East Dry Basin Camp	●			
West Dry Basin Camp	●	●		●
Big Mesa Camp	●			●
Buckhorn Camp		●	●	●
Shute Creek Camp			●	

PAGE 1-54, TABLE 1-19
Is:

Project	...	Operation Water Requirements	...
Bureau of Reclamation			
Big Sandy Salinity Project		25,000 ac-ft/yr	
Chevron Chemical Phosphate Project		25,000 ac-ft/yr (from Fontenelle Reservoir)	

Should Be:

Project	...	Operation Water Requirements	...
Bureau of Reclamation			
Big Sandy Salinity Project		Approximately 13,000 ac-ft/yr	
Chevron Chemical Phosphate Project		22,500 ac-ft/yr (from Fontenelle Reservoir)	

REVISIONS TO TABLES, FIGURES, AND MAPS

PAGE 1-57, TABLE 1-20
Is:

Location	1983	...	1988	1989	...	1995-2000
.						
.						
.						
Exxon						
Well Field Drilling	0	...	120	120		102
.						
.						
.						
Mobil						
Well Field Drilling	25	...	25	25		37
Well Field Operation	14	...	15	15		16
.						
.						
.						
Total	39	...	1,655	1,929		1,108

Should Be:

Location	1983	...	1988	1989	...	1995-2000
.						
.						
.						
Exxon						
Well Field Drilling	0	...	120	120		120
.						
.						
.						
Mobil						
Well Field Drilling	0	...	25	25		37
Well Field Operation	0	...	15	16		16
.						
.						
.						
Total	0	...	1,785	1,796		1,108

PAGE 3-23, TABLE 3-19
Is:

	Facilities			
Streams	Well Pads[1]	Raod Crossings[2]	Pipeline Crossings[3]	...

Should Be:

	Facilities			
Streams	Well Pads[1]	Road Crossings[2]	Pipeline Crossings[3]	...

REVISIONS TO TABLES, FIGURES, AND MAPS

PAGE 3-27, MAP 3-4

-Delete sampling location shown on Fogarty Creek

-Relocate sampling location shown on Indian Creek due north on Middle Piney Creek

PAGE 3-32, FIGURE 3-4

Add:

Note: This wind rose graphically depicts the frequency of occurrence of both wind speed and wind direction (direction from which the wind blows). For example, the above figure indicates that winds blow from the west about 2.4 percent of the time. Westerly winds in the 0-1.7 m/s interval occur about 2 percent of the time; 1.7-3.3 m/s, 1 percent; 3.3-5.4 m/s, 4 percent; 5.4-8.5 m/s, 7 percent; 8.5-10.8 m/s, 5 percent; and greater than 10.8 m/s, 5 percent.

PAGE 3-33, FIGURE 3-5

Add:

Note: See Figure 3-4 for an explanation regarding the interpretation of the wind rose plot.

PAGE 3-34, TABLE 3-21

Is:

Station	...	Jun	...
Big Piney		3.12	
Kemmerer		0.36	
Pinedale		4.06	
South Pass City		4.32	
Lander		4.90	

Should Be:

Station	...	Jun	...
Big Piney		3.12	
Kemmerer		3.62	
Pinedale		4.06	
South Pass City		4.32	
Lander		4.90	

PAGE 3-52, TABLE 3-28

Is:

Recreation/Resource Site	Attraction/Use Restrictions
Big Sandy State Recreation Area	...Day use area with picnic tables. Poor fishing.

Should Be:

Recreation/Resource Site	Attraction/Use Restrictions
Big Sandy State Recreation Area	...Day use area with picnic tables.

REVISIONS TO TABLES, FIGURES, AND MAPS

PAGE 3-60, TABLE 3-31
Is:

Map Key	Operator	...	Market Area
E	Northwest Pipeline	...	West Coast/Gulf States
F	Northwest Pipeline	...	West Coast/Gulf States
G	Northwest Pipeline	...	West Coast/Gulf States

Should Be:

Map Key	Operator	...	Market Area
E	Northwest Pipeline	...	Pacific Northwest
F	Northwest Pipeline	...	Pacific Northwest
G	Northwest Pipeline	...	Pacific Northwest

PAGE 3-62, TABLE 3-32
Is:

Planning Entity	Type of Plan	...	Applicant/Project Component Affected
FS Bridger-Teton National Forest	Forest Plan currently nearing completion (multiple use)		Quasar and Exxon proposed Darby Mountain Unit and portions of proposed North Riley Ridge and Lake Ridge Units of the well field area

Should Be:

Planning Entity	Type of Plan	...	Applicant/Project Component Affected
FS Bridger-Teton National Forest	Forest Plan currently nearing completion (multiple use)		Quasar proposed Darby Mountain Unit and portions of proposed North Riley Ridge Unit and portions of Exxon Lake Ridge Unit of the well field area

PAGE 4-2, TABLE 4-1:
Is:

Category/County	1985	1986	
	.		
	.		
	.		
Change in Annual Average Unemployment Rate Relative to the Baseline -%			
Lincoln	-1.7	1.7	...

Should Be:

Category/County	1985	1986	
	.		
	.		
	.		
Change in Annual Average Unemployment Rate Relative to the Baseline - %			
Lincoln	-1.7	-1.7	...

REVISIONS TO TABLES, FIGURES, AND MAPS

PAGE 4-10, TABLE 4-12
Is:

Jurisdiction	1985	1990	2000

Should Be:

Jurisdiction	1986	1990	2000

PAGE 4-13, TABLE 4-16
Is:

Lincoln County				
Basic Employment				
Mining	327	377	321	273

Should Be:

County/Category	1985	1986	1990	2000
Lincoln County				
Basic Employment				
Mining	327	377	321	273

PAGE 4-67, TABLE 4-45
Is:

Allotment	Acres AUMS	Disturbed[1]
Slate Creek	10,780	-898
	.	.
	.	.
	.	.
LaBarge Ind.	337	-54

Should Be:

Allotment	AUMS	Acres Disturbed[1]
Slate Creek	10,780	98
	.	.
	.	.
	.	.
LaBarge Ind.	337	154

PAGE 4-89, TABLE 4-60
Is:

Populated Area	Individual Annual Risk of Lethal Exposure[1]	Risk of Significant Impact[2]
.		
.		
.		
Big Piney	negligible	0.00008

Should Be:

Populated Area	Individual Annual Risk of Lethal Exposure[1]	Risk of Significant Impact[2]
.		
.		
.		
Big Piney	negligible	0.00040

PAGE 4-99, TABLE 4-70
Is:

	Buckhorn		Shute Creek		Northern	
Allotment	Acres	AUMs[2]	Acres	AUMs[2]	Acres	AUMs[2]
.						
.						
.						
Desert Canyon						

Should Be:

	Buckhorn		Shute Creek		Northern	
Allotment	Acres	AUMs Lost[2]	Acres	AUMs Lost[2]	Acres	AUMs Lost[2]
.						
.						
.						
Desert Common						

REVISIONS TO TABLES, FIGURES, AND MAPS

PAGE 4-142, TABLE 4-107
Add:

Resource	Irreversible Impacts	Irretrievable Impacts	Relationship of Short-Term Use of Environment and Long-Term Productivity
.			
.			
.			
CO_2/Helium	Yes	Yes	The proposed venting of these gas resources would be permanent. If markets for the CO_2 are found or Bureau of Mines determines the helium must be conserved, these impacts may be short term. If not, they would be long term.

PAGE C-16, TABLE C.6-4
Is:

Populated Area	Individual Risk of Lethal Exposure	Individual Annual Risk of Significant Impact[1]
.		
.		
.		
Calpet	0.00018	0.00025

Should Be:

Populated Area	Individual Risk of Lethal Exposure	Individual Annual Risk of Significant Impact[1]
.		
.		
.		
Calpet	negligible	negligible

SECTION 4

CONSULTATION AND COORDINATION

The Bureau of Land Management (BLM) and the Forest Service (FS) requested and received consultation from many organizations and individuals, public and private, in developing the draft and final Environmental Impact Statement (EIS) for the proposed Riley Ridge Natural Gas Project.

SCOPING PROCESS

Regulations for implementing the National Environmental Policy Act (40 CFR, Part 1501.7) require an early and open scoping process. During this process, the scope of issues to be analyzed and significant issues related to the Proposed Action were identified. Information obtained during the scoping process was one of the sources used to determine significant impacts to be addressed in detail in the EIS.

Additional purposes of the scoping process were to inform affected federal, state, and local agencies and other interested persons about the proposal, and to identify existing environmental reports and information related to the proposal. Through the scoping process, decision making is enhanced by emphasizing significant issues and reducing the magnitude of paperwork and the length of the statement.

The details of the public scoping meetings held during the initial phases of the environmental impact statement work are summarized in Appendix A of the draft EIS.

DRAFT EIS CONSULTATION AND COORDINATION

The BLM and FS were joint lead agencies responsible for preparation of the EIS for the Riley Ridge Natural Gas Project. Cooperating agencies included the Fish and Wildlife Service, Federal Energy Regulatory Commission, Corps of Engineers, and the Environmental Protection Agency. All of the above mentioned agencies provided written comments on early drafts of the EIS and the technical reports prior to publication of the draft EIS and Technical Reports in May 1983.

Table 4-1 lists the federal and state agencies, local governments, and individuals that were sent copies of the draft EIS and requested to complete a formal review of the document.

TABLE 4-1
AGENCIES, ORGANIZATIONS, AND INDIVIDUALS REQUESTED TO FORMALLY REVIEW THE DRAFT EIS

FEDERAL GOVERNMENT AGENCIES

Department of Agriculture
- Soil Conservation Service[1]

Department of the Army
- Corps of Engineers[1]

Department of Commerce
- National Oceanic and Atmospheric Administration

Department of Energy

Department of Housing and Urban Development

Department of the Interior
- Bureau of Indian Affairs
- Bureau of Mines[1]
- Bureau of Reclamation[1]
- Fish and Wildlife Service[1]
- National Park Service[1]
- Geological Survey[1]

Department of Transportation

Federal Energy Regulatory Commission[1]

Interstate Commerce Commission

Environmental Protection Agency[1]

Advisory Council on Historic Preservation

STATE GOVERNMENT AGENCIES

Wyoming:
- Conservation Commission
- Department of Agriculture
- Department of Economic Planning and Development

TABLE 4-1
AGENCIES, ORGANIZATIONS, AND INDIVIDUALS REQUESTED TO FORMALLY REVIEW THE DRAFT EIS—continued

Department of Environmental Quality
- Air Quality Division
- Solid Waste Management
- Water Quality Division

Energy Conservation Office
Geological Survey[1]
Office of the Governor
Office of Industrial Siting Administration[1]
Oil and Gas Conservation Commission[1]
Public Service Commission[1]
Recreation Commission[1]
State Engineer's Office[1]
State Forestry Division
State Game and Fish Department[1]
State Highway Department[1]
State Historical Preservation Office[1]
State Planning Coordinator's Office
Water Development Commission

LOCAL GOVERNMENTS

Lincoln County:
- Board of Commissioners
- Planning Office
- Representatives
- Lincoln-Uinta Association of Governments
- South Lincoln County Public Health Nurse
- Town of Kemmerer
- Town of Opal

Sublette County:
- Commissioner
- School District #9
- Sheriff
- Superintendent of Schools
- Zoning Office
- Town of Big Piney[1]
- Town of Marbleton[1]
- Town of Pinedale

Sweetwater County[1]
- Town of Granger

U.S. SENATORS AND REPRESENTATIVES FOR WYOMING

WYOMING STATE LEGISLATURE

ENVIRONMENTAL GROUPS

Defenders of Wildlife[1]
Sierra Club
Sweetwater County Wildlife Association
Wyoming Outdoor Council
Wyoming Wildlife Federation[1]

INDUSTRIES AND INDIVIDUALS

(Detailed list available upon request from BLM, Division of EIS Services, Denver, CO)

[1]Submitted written comments on the DEIS.

PUBLIC REVIEW OF THE DRAFT EIS

The draft EIS (INT.DEIS-83-34) was filed with the Environmental Protection Agency on May 20, 1983, and announced in the Federal Register on Thursday, May 26, 1983 (Vol.48, No.103, Page 23,719). In addition, media releases were sent to area radio stations and newspapers to announce the availability of the draft EIS and locations of public hearings, described the Proposed Action, identified key impacts, and requested public comment on the adequacy of the statement.

Approximately 850 copies of the draft EIS were distributed by mail to various individuals, organizations, and government agencies.

During the 60-day public comment period (May 20 to July 19, 1983), BLM and FS conducted four formal public hearings to solicit comments on the draft EIS (see ***Table 4-2*** for further details). The public hearing transcripts have not been reprinted in the EIS as they are part of the public record. Copies of the hearings are available for review at the following offices:

Bureau of Land Management
U.S. Department of the Interior
Bureau of Land Management
Wyoming State Office
2515 Warren Avenue
P.O. Box 1828
Cheyenne, WY 82001

District Manager
Bureau of Land Management
Rock Springs District Office
P.O. Box 1869
Highway 191 North
Rock Springs, WY 82901

Area Manager
Bureau of Land Management
Pinedale Resource Area
P.O. Box 768
431 West Pine Street
Pinedale, WY 82941

Area Manager
Bureau of Land Management
Kemmerer Resource Area
P.O. Box 632
415 U.S. 30 North
Kemmerer, WY 83101

Table 4-2
DRAFT EIS PUBLIC HEARINGS

Hearing/Date	Administrator	Panel	Attendance	Speakers
Pinedale, WY 06/27/83	Robert Bennett, BLM	B. Shark - BLM C. Hanson - BLM P. Roseberry - BLM B. McMahan - BLM D. Turner - FS D. Ludwig - ERT	56	9
Big Piney, WY 06/28/83	Robert Bennett, BLM	B. Shark - BLM C. Hanson - BLM B. McMahan - BLM D. Turner - FS D. Ludwig - ERT	60	8
Kemmerer, WY 06/29/83	Robert Bennett, BLM	B. Shark - BLM C. Hanson - BLM P. Roseberry -BLM B. McMahan - BLM D. Turner - FS D. Ludwig - ERT	56	18
Rock Springs, WY 06/30/83	Robert Bennett, BLM	B. Shark - BLM C. Hanson - BLM P. Roseberry - BLM B. McMahan - BLM D. Turner - FS D. Ludwig - ERT	29	8

Forest Service
U.S. Department of Agriculture
Forest Supervisor
Bridger-Teton National Forest
P.O. Box 1888
340 N. Cache Street
Jackson, WY 83001

District Ranger
Big Piney Ranger District
P.O. Box 218
591 Front Street
Big Piney, WY 83113

The BLM also received 44 letters addressing the draft EIS during the public comment period. All letters and testimony were assigned a reference number and reviewed. Substantive comments (those that presented new data, questions or new issues bearing directly on the effects of the Proposed Action and its alternatives) were responded to; where appropriate, draft EIS sections were revised. ***Table 4-3*** lists the reference numbers and identifies the commenters. All changes have been addressed in this final EIS. Letters that did not address the adequacy of the draft EIS did not require a response.

COMMENTS AND RESPONSES

As mentioned above, each comment letter was assigned a reference number. Individual substantive comments within each letter were then identified and responded to. All comment letters have been reprinted verbatim except for their respective attachments. The responses, which accompany each letter, are identified by the reference numbers which appear on the comment letter.

The comment responses either explain that the text to the DEIS has been revised to incorporate the change recommended by the commenter or explain why a text change was not appropriate. Letters that required no response are reprinted following the Public Hearings section.

TABLE 4-3
LETTERS WITH SUBSTANTIVE COMMENTS

Reference No.	Source of Letter
1	Oregon-California Trails Association, (organization)
2	Dudley Gardner, Rock Springs, WY, (citizen)
3	David G. Buck, Green River, WY, (citizen)
4	Jlt & Daughters, Big Piney, WY, (business)
5	Reg. P. Duffin, LaGrange Park, IL, (citizen)
6	Geological Survey, Reston, VA (Federal agency)
7	Edward H. Feeley, Kemmerer, Wy, (citizen)
8	Bureau of Reclamation, Salt Lake City, UT, (Federal agency)
9	City of Green River Planning and Zoning, Green River, WY (local agency)
10	Sweetwater County Planning Department, Green River, WY (county agency)
11	Department of Health & Human Services, Atlanta, GA (Federal agency)
12	Trout Unlimited, Upper Green River Chapter, Pinedale, WY (organization)
13	Walter C. Yose Jr., LaBarge, WY, (citizen)
14	Carr's Appliance & True Value Hardware, Big Piney, WY, (business)
15	Big Piney Town Council (Maicille Carr), Big Piney, WY, (local agency)
16	JF Ranch, Inc., Big Piney, WY, (business)
17	Carmen D. Hakola, LaBarge, WY, (citizen)
18	National Park Service, Denver, CO, (Federal agency)
19	Oregon-California Trails Association, Gerald, MO, (organization)
20	Department of Public Works, City of Rock Springs, WY (local agency)
21	Northwest Pipeline Corporation, Salt Lake City, UT (applicant)
22	Defenders of Wildlife, Washington, D.C., (organization)
23	Exxon Company, U.S.A., Midland, TX, (applicant)
24	Chester and Karen Buck, LaBarge, WY, (citizens)
25	Federal Energy Regulatory Commission, Washington, D.C., (Federal agency)
26	Fish and Wildlife Service, Cheyenne, WY, (Federal agency)
27	Wyoming Executive Department, Cheyenne, WY, (state agency)
	Game and Fish Department
	State Engineer's Office
	Wyoming Recreation Commission
	State Historic Preservation Office
	State Highway Department
	Office of Industrial Siting Administration
	Geological Survey of Wyoming
	Oil and Gas Conservation Commission
	Public Service Commission
28	Environmental Defense Fund, Boulder, CO, (organization)
29	American Fisheries Society, Colorado-Wyoming Chapter, Laramie, WY, (organization)
30	Environmental Protection Agency, Region VIII, Denver, CO (Federal agency)
31	American Quasar Petroleum Co., Fort Worth, TX, (applicant)
32	Soil Conservation Service, Casper, WY, (Federal agency)
33	Bureau of Mines, Denver, CO, (Federal agency)
34	Wyoming Wildlife Federation, Cheyenne, WY, (organization)
35	Department of the Army, Corps of Engineers (Federal agency)

OREGON-CALIFORNIA TRAILS ASSOCIATION

Board Of Directors
James F. Bowers (1985)
450 South Otis St.
Lakewood, CO 80226
(303) 922-0535
E. G. Chuinard, M.D. (1984)
15537 Southwest Summerfield Lane
Tigard, OR 97223
(503) 620-7744
Troy Gray (1984)
3947 Park Lane
Dallas, TX 75220
(214) 350-0176
Thomas H. Hunt (1983)
950 Old Trace Road
Palo Alto, CA 94306
(415) 941-0815
James P. Johnson (1983)
P.O. Box 608
Fort Collins, CO 80522
(303) 482-5058
Stanley B. Kimball (1985)
745 Saddle Drive
Florissant, MO 63033
(314) 831-7873
John A. Latschar (1985)
794 Urban Street
Golden, CO 80401
(303) 234-6103
Charles W. Martin (1985)
411 North 61st Street
Omaha, NE 68132
(402) 556-4488
Merrill J. Mattes (1984)
5800 W. Plymouth Avenue
Littleton, CO 80123
(303) 979-6007
Bertha L. Rennells (1983)
Box 746
La Grande, OR 97850
(503) 963-5820
Robert D. Tucker (1984)
10380 Glennon Drive
Lakewood, CO 80226
(303) 985-9331
Merle W. Wells (1983)
1325 Longmont
Boise, ID 83706
(208) 342-3135
Gregory M. Franzwa (1982)
Chairman
Box 42
Gerald, MO 63037
(314) 764-2801

Honorary Board Member
Russell E. Dickinson, Director
National Park Service
Washington, D.C.

Officers
President:
Gregory M. Franzwa
Executive Vice President:
Merrill J. Mattes
1st Vice President:
Robert Rennells
Box 746
La Grande, OR 97850
(503) 963-5820
2nd Vice President:
Mrs. Billie Gray
3947 Park Lane
Dallas, TX 75220
(214) 350-0176
Secretary:
John A. Latschar
Assistant Secretary:
Robert D. Tucker
Treasurer:
James F. Bowers

Legal Counsel
James P. Johnson

May 30, 1983

RECEIVED
JUN 2 1983
OFFICE

Ms. Janis VanWyhe, Project Leader
Bureau of Land Management
Division of EIS Services
555 Zang Street - 1st Floor East
Denver, CO 80228

Dear Ms. VanWyhe:

I thank you for sending two copies of the Riley Ridge EIS to me. I have forwarded one to Mr. & Mrs. Chester Buck of La Barge, Wyoming; and the other to Mr. Reg P. Duffin of La Grange Park, Illinois. Mr. & Mrs. Troy Gray of Dallas will join Mr. & Mrs. Buck at their Green River ranch in three weeks to discuss the EIS in depth.

Please send copies of the Final EIS to me and to each of them:

Mr. & Mrs. Chester Buck Box 147 La Barge, WY 83123	Mr. & Mrs. Troy Gray 3947 Park Lane Dallas, TX 75220	Mr. Reg P. Duffin 822 Beach La Grange Park, IL 60525

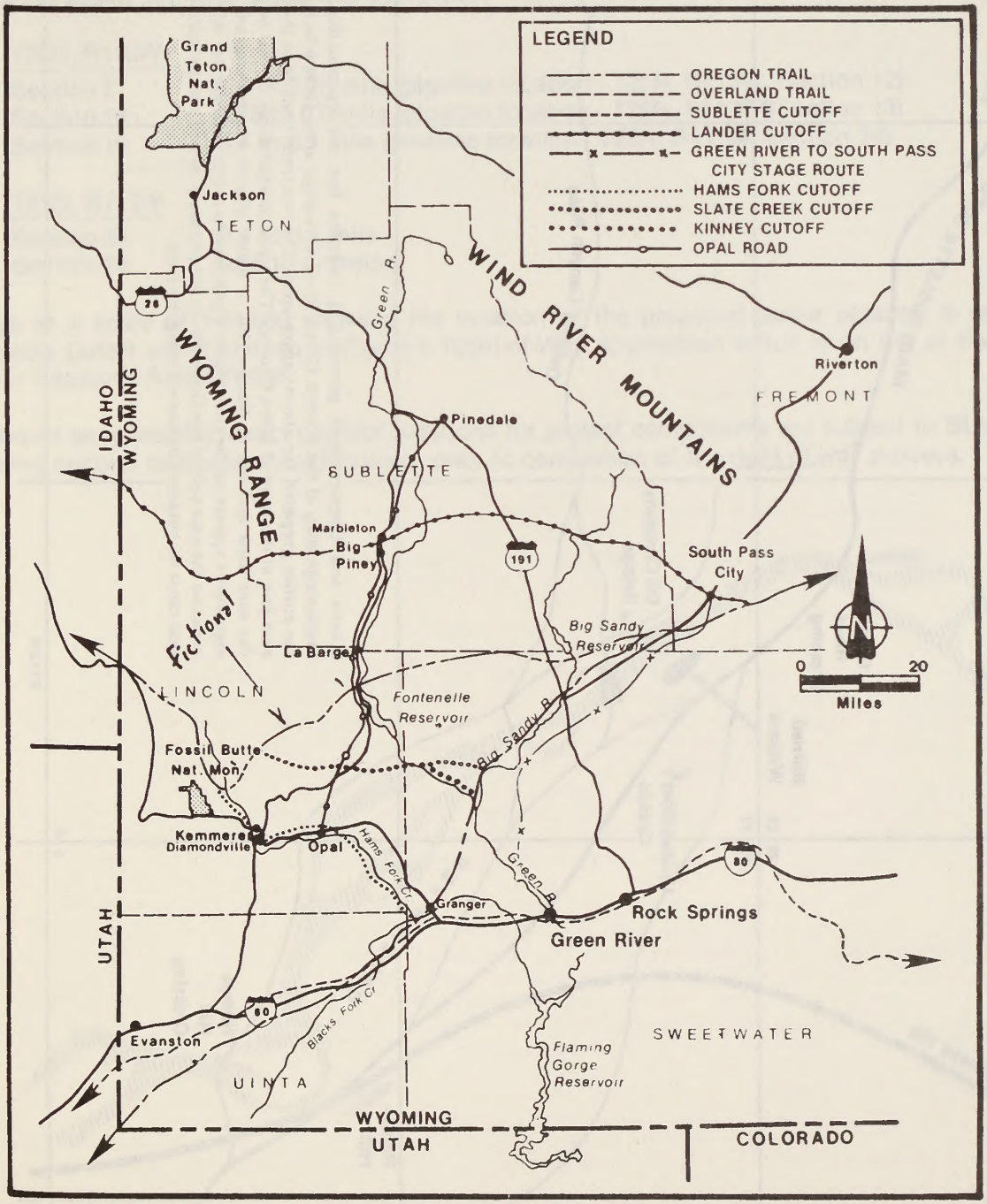
1.1 There is a very serious error on your Map 3-6, which appears on page 3-47. It shows the Sublette Cutoff going west-southwest from the Green River Crossing north of Names Hill (and south of La Barge). Actually the emigrant road turns south to parallel the river for some distance before it slants to the southwest.

1.2 That probably is the source of our most serious concern; the molten sulfur pipeline appears to parallel that road just a few yards from it, creating a terrible visual intrusion for many miles. I don't think our board could reasonably object to an occasional crossing of the emigrant trails by either elevated or buried lines, but to parallel it with an elevated line is unthinkable. A map prepared by Mr. & Mrs. Buck is enclosed showing the correct routing of the trails.

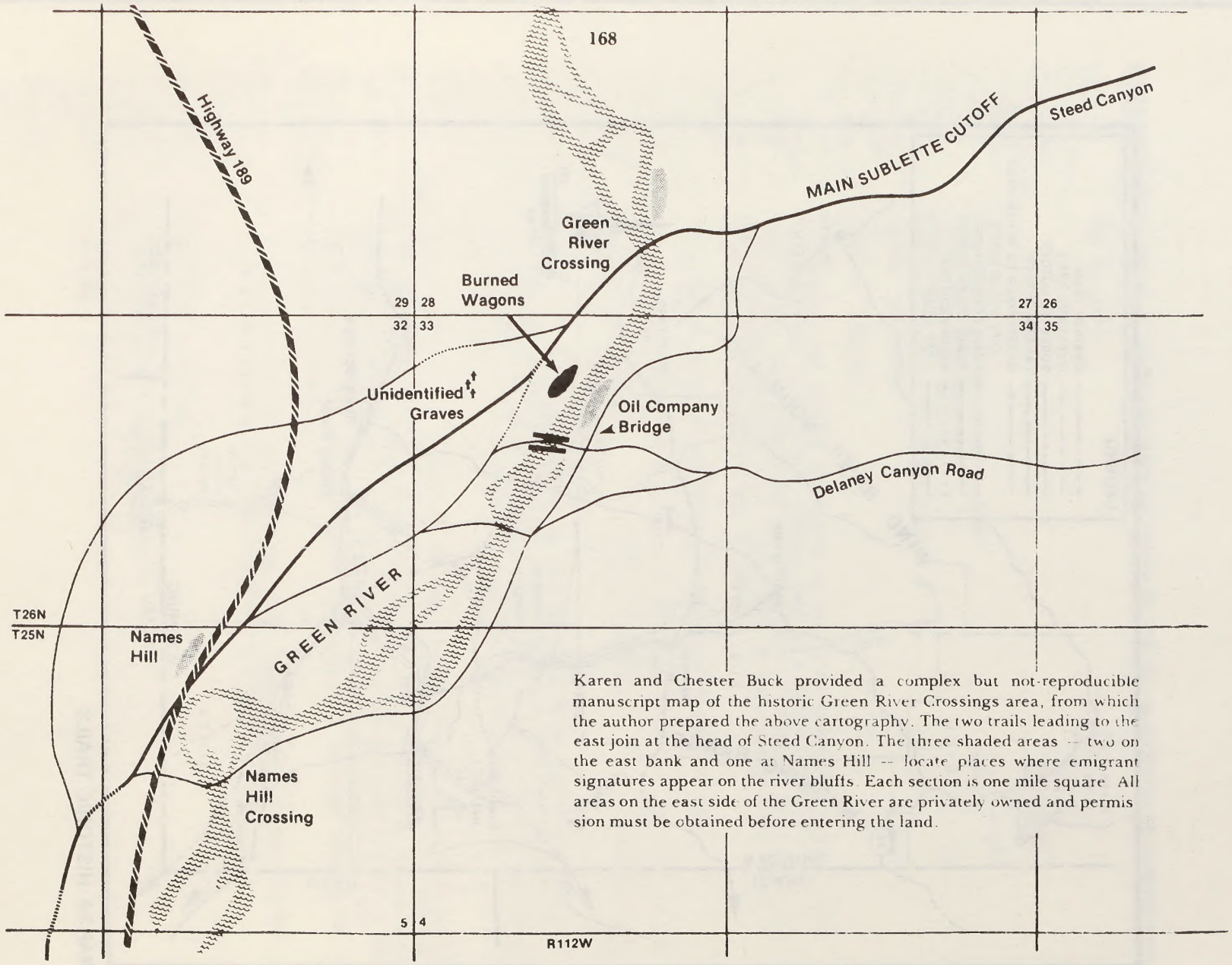
On the whole I think you have done a most careful job with your EIS and I think you have presented the situation with objectivity.

Cordially,

Gregory M. Franzwa
President



MAP 3-6 HISTORIC TRAILS



Karen and Chester Buck provided a complex but not-reproducible manuscript map of the historic Green River Crossings area, from which the author prepared the above cartography. The two trails leading to the east join at the head of Steed Canyon. The three shaded areas -- two on the east bank and one at Names Hill -- locate places where emigrant signatures appear on the river bluffs. Each section is one mile square. All areas on the east side of the Green River are privately owned and permission must be obtained before entering the land.

Responses to Comment Letter 1

1.1 The comment is correct in that the Sublette Cutoff turns south for approximately 5 miles after crossing the Green River; the trail then continues to the southwest. Because Map 3-6 in the DEIS covers such a large area, the locations of the historic trails should be interpreted as approximate.

1.2 The proposed action route of the molten sulfur pipeline would vary in distance from the Emigrant Trail (Sublette Cutoff) along the 4-mile section north of where the pipeline would cross the Trail. The range of distance within this area is summarized below:

T25N, R112W	
Section 7	1.0 to 0.75 mile (pipeline location - T25N, R113W, Section 12)
Section 18	0.75 to 0.5 mile (pipeline location - T25N, R113W, Section 13)
Section 19	0.4 to 0.1 mile (pipeline location - T25N, R113W, Section 24)

T25N, R113W	
Section 25	0.4 to 0.1 mile
Section 36	0.25 to crossing

Maps at a scale of 1:24,000 showing the location of the proposed sulfur pipeline in relation to the Sublette Cutoff are contained in Exxon's Right-of-Way Application which is on file at the BLM's Kemmerer Resource Area Offices.

It should be noted that exact corridor locations for project components are subject to BLM approval, including cultural resource considerations, prior to completion of the right-of-way process.

Comment Letter 2

June 2, 1983

RECEIVED

JUN 6 1983

...S OFFICE

BLM Division of Environmental
Impact Statement Services
555 Zanj Street
First Floor, East
Denver, CO 80228

Re: Riley Ridge Project

Dear Sir or Madam:

As always, you do not provide enough time to make educated and documented comments on your Environmental Impact Statements (EIS). The Riley Ridge Natural Gas Project Draft Environmental Impact Statement was issued in May, 1983, and comments had to be received no later than July 19, 1983. The time constraints are not fair to a working public, as comments have to be written after work, or in any free moment and not at leisure.

2.1 The mitigative measures you propose are only adequate in one case and that is in regard to Wildlife and Fisheries. The others lack depth and concern for the impacted resources. Just one example is the portion on socioeconomic impacts and mitigation. Your grasp of the human trauma in a transient boom town is totally lacking. Inadequate housing is not an issue lightly passed over. Until you have moved to a town and had to have lived in a camper or tent with your family, you cannot possibly understand how degrading the situation can become. Lack of sanitary facilities, inadequate food storage area, and at times poor heating due to the nature of the structures themselves, cause undue hardships.

2.2 The energy corporations investing in Riley Ridge all intend to enjoy profits from their endeavors. Because of this, they should be obligated to provide adequate housing and spaces for mobile homes prior to starting up their projects. When adequate housing is not provided, "squatting" should be expected. It is

2.3 a human right to have a place to live. Expansion of the sort proposed in the EIS statement should not be allowed unless housing space for the numbers estimated by the Department of Interior is first provided. To realize living spaces do not exist for the incoming workers, and not make provisions for housing is criminal. It is negligence of the worst kind and should not just be described, but dealt with. Either the energy companies involved or the

2.4 Federal government should ensure that housing is available. The haphazard planning evident in Evanston, Gillette, Craig, Rock Springs, and elsewhere is no longer permissible. Both the energy companies and the Federal agencies will receive monetary benefits for their efforts in Riley Ridge, and so should the worker. And asking that the laborer be provided with a place to rent, lease or buy is not an inordinate request.

Sincerely,

Dudley Gardner

Dudley Gardner
Rock Springs

Responses to Comment Letter 2

2.1 Housing is identified in the DEIS as the single most significant socioeconomic impact of the proposed Riley Ridge Project, one that remains even given the company-committed mitigation measures. In recognition of the experiences of earlier boom town situations in Wyoming, the state's Industrial Siting Council requires that a mitigation plan for housing be developed jointly by the applicants and the communities. It further requires monitoring of local housing to try to assure that housing needs are met as near to the time that they occur as possible. The jurisdiction of the Industrial Siting Council and its detailed requirements for housing mitigation planning and monitoring are noted in the DEIS (page 1-13). Any right-of-way grant that the BLM might issue based on this DEIS would require that state regulations, in particular those of the Industrial Siting Council, be met. Given this, the level of detail presented in the DEIS is appropriate.

2.2 Development on the scale of the proposed project provides business opportunities for other industrial sectors. To require that the applicants provide housing would remove the opportunity for residential developers. Through the monitoring program required by the Industrial Siting Council, any housing needs not met through the efforts of residential developers will be identified and the companies will be required to propose means of satisfying them.

2.3 Estimation of housing need and supply is difficult for a number of reasons. Recognizing the uncertainty of such long-term forecasts and the risk of financial loss if units consistent with these estimates were provided before a project began, the Industrial Siting Council requires continuous monitoring of housing needs, trying to match needs with supply on as nearly a simultaneous basis as possible. A plan for filling potentially unmet needs is then an obligation of the applicants. The implementation of this plan is carefully monitored by the Industrial Siting Council and violation could result in an ordering of work stoppage.

2.4 Granting of any right-of-way from the BLM and FS on the basis of the EIS will carry with it stipulations requiring compliance with all state and local regulations (see Appendix B.2 of the DEIS. Given the Industrial Siting Council requirements with respect to housing, there will be every effort made to ensure provision of needed housing.

DAVID G. BUCK
1495 INDIAN HILLS
GREEN RIVER, WY 82935

MS JANIS VAN HYNE
BUREAU OF LAND MANAGEMENT
DIVISION OF EIS SERVICES
555 ZANG STREET, FIRST FLOOR EAST
DENVER, COLORADO 80228

LET ME START BY SAYING I'M A PROFESSIONAL ENGINEER, EMPLOYED BY INDUSTRY AND A CONSERVATIVE REPUBLICAN. I MOVED TO WYOMING FOR THE OUTDOOR RECREATIONAL OPPORTUNITIES AND HAVE CAMPED, HUNTED AND FISHED EXTENSIVELY IN THE RILEY RIDGE AREA, WITH MY WIFE AND TWO DAUGHTERS. WE ALL HUNT AND FISH AND HAVE SEEN THE DAMAGE THAT HAS ALREADY BEEN DONE. EVEN NOW THE THE DAMAGE IS CONTINUING WITHOUT PROPER SAFEGUARDS, MONITORING AND CONTROL. THE BLM AND THE GAME WARDENS ARE UNDERSTAFFED TO OVERSEE THE WORK.

I KNOW WE NEED AND MUST DEVELOP THE RESOURCES TO ENABLE US TO MAINTAIN OUR INDUSTRIAL AND MILITARY COMPLEX. HOWEVER, I BELIEVE IT CAN BE DONE IN A MANNER THAT WILL SIGNIFICANTLY MINIMIZE THE IMPACT SOCIALLY, ECONOMICALLY AND ENVIRONMENTALLY.

3.1 1. LIMIT THE AMOUNT OF ACTIVITY IN ANY ONE AREA AT THE EXPENSE OF A LONGER DEVELOPMENT SCHEDULE.

3.2 2. HAVE THE DEVELOPERS PROVIDE A GRANT TO THE STATE FOR HIRING ADDITIONAL GAME WARDENS, BIOLOGISTS AND ENVIRONMENTALISTS.

3.3 3. PROVIDE FOR PROPER SANITARY FACILITIES AND EROSION CONTROL STRUCTURES ---- MONITORED AND MAINTAINED UNTIL ABANDONMENT.

4. LIMIT TRAVEL ON NEW ROADS.

3.4 USE BUSES TO TRANSPORT WORKERS INTO THE AREA AND PROHIBIT ANY AND ALL VEHICLES FROM CARRYING ANY ARMS. ALL GAME KILLS TO BE PAID FOR BY THE DEVELOPER AT THE CALCULATED VALUE TO THE STATE.

3.5 5. CLOSE ALL ROADS TO THE PUBLIC.

3.6 6. FORM A CITIZENS GROUP TO MONITOR THE OPERATIONS.

3.7 7. DO NOT ALLOW OPERATIONS TO PREVENT ACCESS TO CAMPERS AND HUNTERS ---- THEY MAY BE ON FOOT OR HORSEBACK.

3.8 8. DIRECTIONAL DRILLING SHOULD BE MAXIMIZED.

3.9 9. PREVENT WORKER CAMPS OF ANY TYPE, EXCEPT IN EXISTING TOWNS. STRICT ENFORCEMENT OF LITTERING LAWS.

3.10 10. DUST CONTROL FOR ALL ROADS AND DRILL SITES.

I'M CONFIDENT THE WORK CAN PROCEED WITHOUT DELAY AND IT CAN BE DONE WITHOUT AS MUCH DAMAGE AS IS DESCRIBED IN THE DRAFT EIS.

Donald Beck

Responses to Comment Letter 3

3.1 Where possible, this will be considered in the final decision making process.

3.2 This measure has been presented in Appendix D of the DEIS as an uncommitted mitigation measure. It has been a common practice of the state in the past and will be considered by the state when the Industrial Siting Administration permit conditions are issued.

3.3 Sanitary facilities are required by federal and state laws. See page 1-8 of the DEIS for the state acts and authority.

Erosion control is required under the right-of-way grants, see Appendix B of the DEIS, Required Federal Measures and applicants Standard Operating Procedures.

3.4 These comments will be considered in ISA's review of the project, but cannot be required by the federal government (see Appendix D of the DEIS, Uncommitted Mitigation Measures).

3.5 This practice will be considered where possible (i.e., a single purpose dead end road). Please refer to General Measures 47, 50, and 52 in Appendix B.5 of the DEIS.

3.6 The agencies will perform monitoring operations and will coordinate with and obtain input from local citizens. However, the Federal Government cannot require a citizen group to monitor operations.

3.7 Access is required by Required Federal Measures, see Appendix B of the DEIS.

3.8 The BLM and FS agree with this idea and encourage this concept of multiple wells on a single well pad and directional drilling. It will be encouraged where practiceable and where necessary to minimize undue or unnecessary environmental degradation. This concept will be utilized on a case-by-case basis where it appears to be functional and appropriate. Please refer to page 1-52 of the DEIS for further discussion of directional drilling.

3.9 These two points will be considered by the state when the ISA permit is reviewed.

3.10 The lessees are required to prepare a Construction and Use Plan which will cover these points. See page 1-12 of the DEIS for details on what will be covered. See also General Measure 54 in Appendix B.5 of the DEIS.

Comment Letter 4

jt & daughters

June 29,1983

Ms Janis VanWyhe
Bureau of Land Management
Division of EIS Services
555 Zang Street, First Floor East
Denver, Colorado 80228

Dear Ms. VanWyhe,

After reading the DEIS and attending the Public meeting in Big Piney, I felt an obligation to draft a letter to you. I am a life long resident of Big Piney, I own property in both Big Piney & Marbleton as well as within the proposed drilling program.

I would like to compliment the agencies and especially the individuals responsible for the preparation of such a document. It is very comprehensive and I belive addresses all possible problems. The one thing it fails to address is the positive side of the entire project, namely -a a shot in the arm for a sagging economy- jobs in a high unemployment area, and in general a tremendous boost to the entire southwest Wyoming area. 4.1

I do take exception to the recommendation that the Shute Creek alternative be accepted. I would rather see any of the Northern alternatives be recommended, mainly because of the close proximity to the source. I do not feel that the transporting of raw sour gas in excess of 50 miles through a pipeline as being the safest or the most logical solution. I have grown up within these oil and gas fields and know the problems of unintentional ruptures caused by digging, crossing, expansion, contraction and a multitude of other causes. Therefore I would like to see the plants as colse to the gas field as possible, whether it be East Dry Basin, West Dry Basin,Buckhorn or Big Mesa. 4.2

Again I would like to compliment you and all involved on a most thorough and comprehensive study.

Sincerely

John Tanner

John Tanner

box 728 big piney, wy. 83113

Responses to Comment Letter 4

4.1 The anticipated impacts of the proposed project are both positive and negative. The positive impacts include increased employment and increased local revenue. These are noted in the Summary (Section 1) of the FEIS and again in the text. More importantly, the positive fiscal impacts are several times noted as offsetting some of the anticipated service impacts. The emphasis of the DEIS is a worst-case analysis that stresses identification of impacts requiring a long time and/or large commitment of resources to alleviate. Hence, the project's positive impacts are only summarized while the negative impacts are dealt with in detail.

4.2 Thank you for your comment. It will be considered in the final decision making process. Please refer to Section 2 of the FEIS for a comparison of health and safety impacts for the four siting alternatives.

Comment Letter 5

822 Beach Ave.,
La Grange Park,
Illinois 60525.

30th June, 1983

Ms. Janis VanWyne, Project Leader
Bureau of Land Management
Division of EIS Services
555 Zang Street - 1st Floor East
Denver, CO 80228

Dear Ms VanWyhe,

I am in receipt of the Riley Ridge Natural Gas Project Report which is certainly most well prepared and comprehensive. My concerns are the Oregon Trail routes which may be affected by proposals in the report.

5.1 Below La Barge, Lincoln County, at Names Hill it appears that a proposed above ground sulfur pipeline will merge, then closely parallel about four miles of pristine Sublette Cutoff Trail southward through Sec.7, 18 and 19 T25N R112W through Sec.25, 36 T25N R113W. This area includes Holden Hill early emigrant names etc. Can this proposed pipeline be diverted to avoid intrusion along this stretch of trail?

At the Lombard Buttes Seedskadee National Wildlife area a proposed railroad line would run northward adjacent to the Oregon-California-Mormon-Pony Express crossing areas along an eight mile stretch of the Green River. The Railroad appears to bridge the Green River near the historic Upper Ferry site. To the best of my knowledge this area remains the only major river crossing site along the extent of the Oregon-California trails to have such minimum intrusion. I feel that every effort should be made to preserve and interpret this area for future generations to enjoy. While beyond the scope of the Riley Ridge Report I am aware that the Wyoming Highway Department have plans for a highway bridge to cross the Green River at the Lombard Ferry area, I feel all such proposed intrusions at this historic trail site are in conflict with the intent of the National Trail Systems Act of 1979. I trust that all involved government agencies will vigilantly monitor this developing situation and if necessary effect suitable compromise to protect this historic area.

I am a charter member of the Oregon-California Trails Association and have sent copies of the enclosures to all board members to alert them of what might transpire at these areas.

Thank you for the opportunity to express my concern.

Sincerely,

Reg.P. Duffin

Enc: 3

822 Beach Ave.
La Grange Park
Illinois 60525

Board Members and Officers,
Oregon-California Trails Association

20th June, 1983

Gentlemen,

Greg Franzwa forwarded to me, for study, a copy of the Riley Ridge Natural Gas Project Report which encompasses Sublette, Lincoln and Sweetwater Counties, Wyoming. With Greg's approval the following is brought to your attention.

5.2 1. A proposed above ground molten sulfur pipeline will intersect Sublette Cutoff near Names Hill (below La Barge, Lincoln County). The proposed route will then very closely parallel that cutoff through Sec.7, through Sec.18 the area of Holden Hill (emigrant names etc.), through Sec.19 T25N R112W, continue southward through Sec.25, Sec.36 T25N R113W totalling approximately four miles.

5.3 2. A careful study of a difficult map to interpret, Map 1-4 entitled Component Alternates (partial photocopy enclosed), shows a proposed railroad line to transport sulfur would run northward through part of the Seedskadee National Wildlife Area and then would run in close proximity to the Green River ferry sites at Lombard Buttes.

The enclosed photocopy of detailed crossing area map is <u>not</u> part of the Riley Ridge Report but may help you to make a preliminary assessment of what impact intrusion, future interpretation, safety of public access, etc. a sulfur transport railroad line would have to the Oregon-California-Mormon-Pony Express Trails crossing areas at Lombard Buttes.

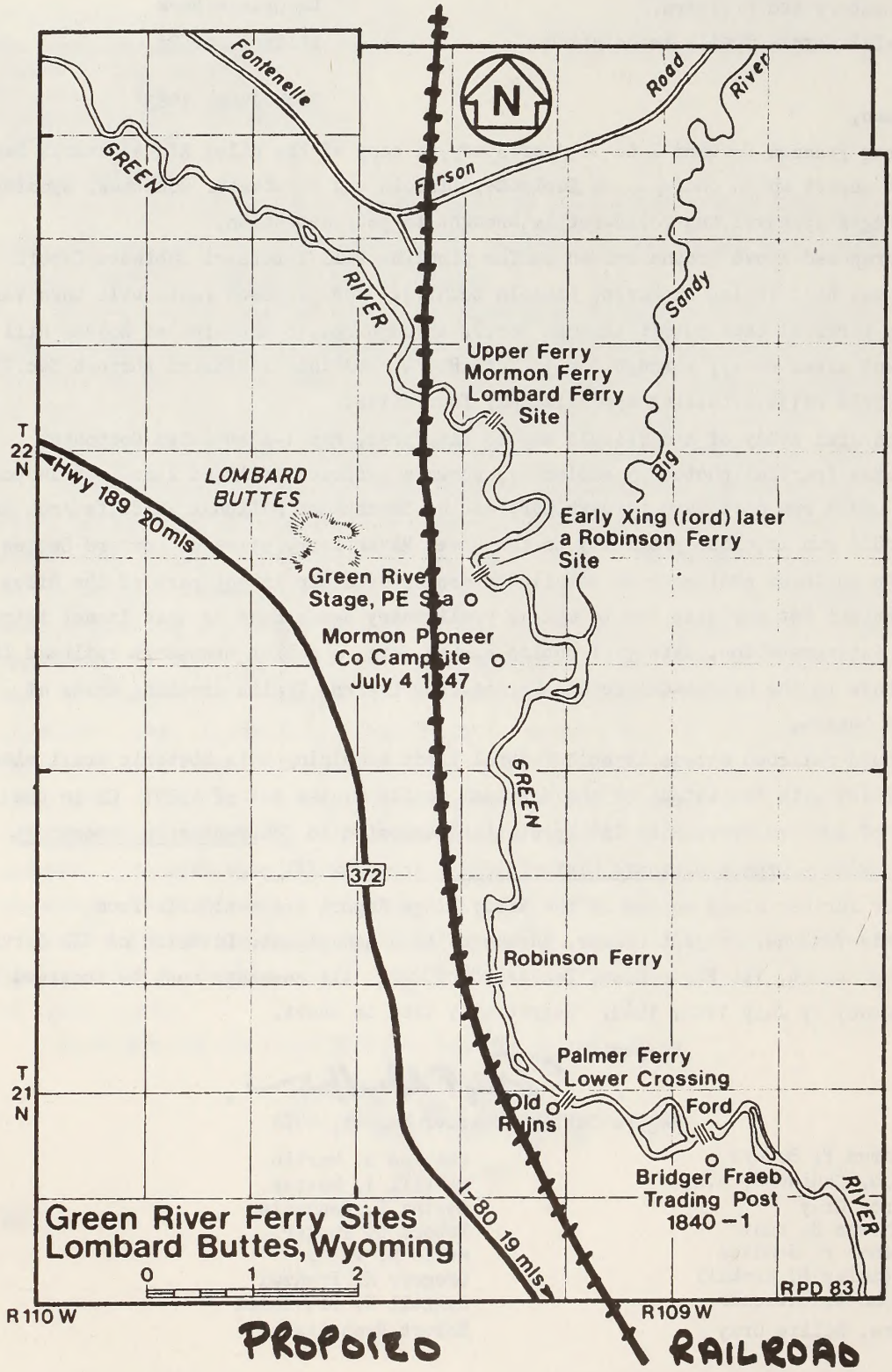
5.4 Would railroad access through federal lands adjoining this historic trail site be in conflict with the intent of the National Trails System Act of 1979? Or in the spirit of Lombard Ferry Site Interpretation suggested in <u>Comprehensive Management and Use Plan - Oregon National Historic Trail</u> Appendix III page 215.

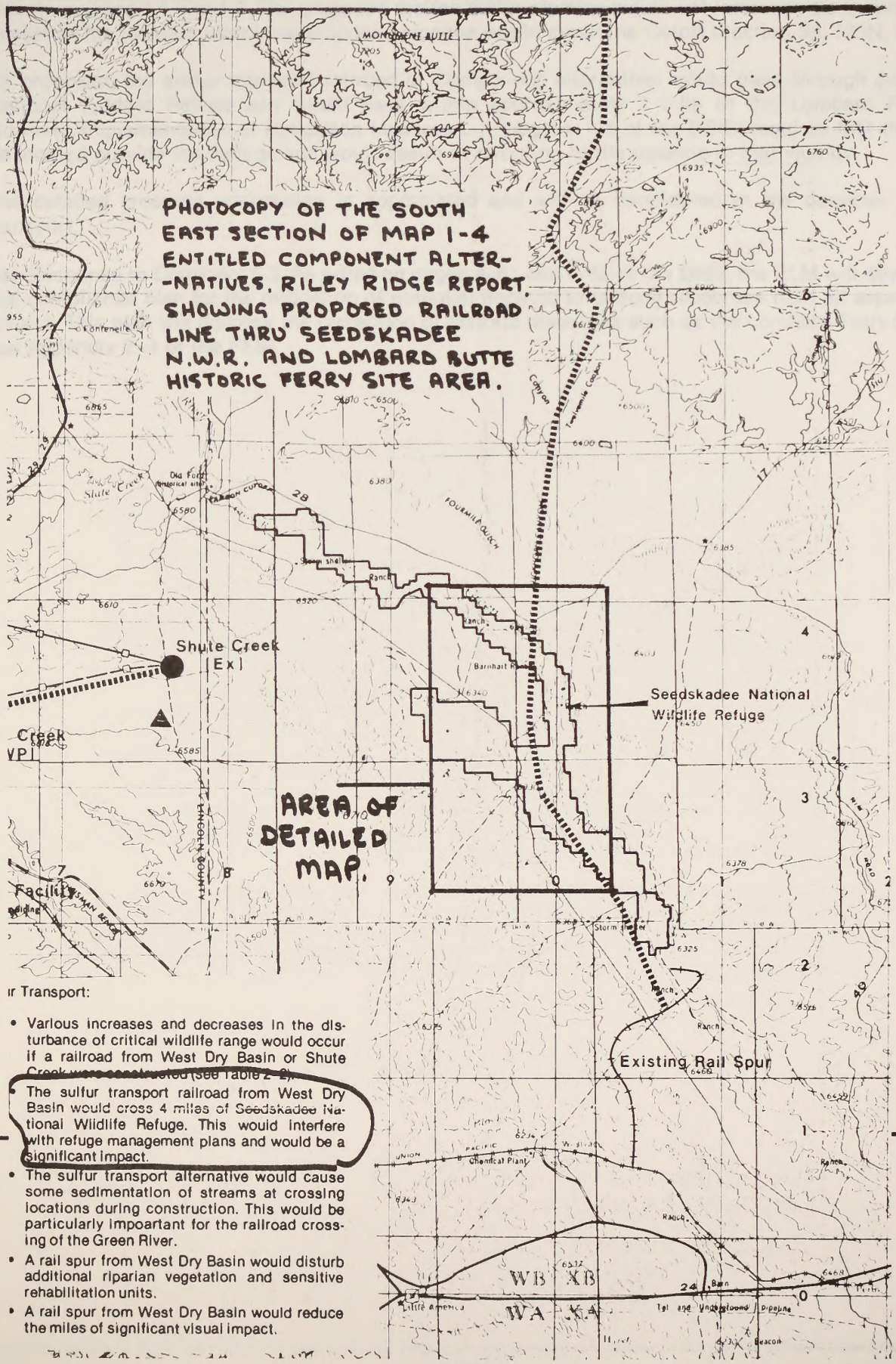
For further study copies of the Riley Ridge Report are available from Ms. Janis VanWyne, Project Leader, Bureau of Land Management, Division of EIS Services, 555 Zang Street, 1st Floor East, Denver, CO 80228. All comments must be received by this agency by July 19th, 1983. Regretfully time is short.

Respectfully,

Reg.P. Duffin, Charter Member, OCTA

cc: James F. Bowers
E.G. Chuinard, M.D.
Troy Gray
Thomas H. Hunt
James P. Johnson
Stanley B. Kimball
John A. Latschar
Mrs. Billie Gray
Charles W. Martin
Merrill J. Mattes
Bertha L. Rennells
Robert D. Tucker
Merle W. Wells
Gregory M. Franzwa
Russell E. Dickinson
Robert Rennells


Fontenelle
Road
River
N
GREEN
Farson
RIVER
Sandy
Big
Upper Ferry
Mormon Ferry
Lombard Ferry
Site
T
22
N
Hwy 189 20mls
LOMBARD
BUTTES
Early Xing (ford) later
a Robinson Ferry
Site
Green River
Stage, PE Sta
Mormon Pioneer
Co Campsite
July 4 1847
GREEN
372
Robinson Ferry
Palmer Ferry
Lower Crossing
T
21
N
Old
Ruins
Ford
Bridger Fraeb
Trading Post
1840 – 1
RIVER
I-80 19 mls
Green River Ferry Sites
Lombard Buttes, Wyoming
0
1
2
RPD 83
R110 W
R109 W
PROPOSED
RAILROAD



ir Transport:

- Various increases and decreases in the disturbance of critical wildlife range would occur if a railroad from West Dry Basin or Shute Creek were constructed (see Table 2-2).
- The sulfur transport railroad from West Dry Basin would cross 4 miles of Seedskadee National Wildlife Refuge. This would interfere with refuge management plans and would be a significant impact.
- The sulfur transport alternative would cause some sedimentation of streams at crossing locations during construction. This would be particularly impoartant for the railroad crossing of the Green River.
- A rail spur from West Dry Basin would disturb additional riparian vegetation and sensitive rehabilitation units.
- A rail spur from West Dry Basin would reduce the miles of significant visual impact.

Responses to Comment Letter 5

5.1 See Responses 1.1 and 1.2.

5.2 See Responses 1.1 and 1.2. The proposed molten sulfur pipeline would not intersect the Sublette Cutoff except at the location where the proposed pipeline would cross the Cutoff (Section 36, T25N, R113W).

5.3 As proposed, the sulfur transport railroad (a Component Alternative) would pass through Seedskadee National Wildlife Refuge and would pass within approximately 1 mile of the Lombard Ferry Site. However, implementation of Mitigation Measure L-1 (page 4-138 of the DEIS) requires that the railroad be located outside the Refuge and would result in rerouting of the pipeline in that vicinity.

The detailed crossing information is appreciated and will be considered in the decision for sulfur transport.

5.4 See Response to Comment 5.3. As noted on pages 4-61 and 4-62 of the DEIS, the BLM will develop a formal compliance plan for the mitigation of potential impacts to cultural resources from all aspects of the project. This plan will address the protection of historic resources such as the Lombard Ferry Site. Also, see Appendix E-4 of the FEIS.

Comment Letter 6

United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VA. 22092

In Reply Refer To:
EGS-Mail Stop 423

JUN 30 1983

Memorandum

To: Riley Ridge Project Leader, Bureau of Land Management
Denver, Colorado

From: Assistant Director for Engineering Geology

Subject: Review of draft environmental statement for Riley Ridge Natural Gas Project, Sublette, Lincoln, and Sweetwater Counties, Wyoming

We have reviewed the draft statement as requested in the letter of May 20 from the State Director.

The statement makes the following recommendation: "Formulate a general groundwater monitoring program, or alternatively, determine that additional aquifer testing is necessary before a detailed groundwater program can be formulated, or determine that a groundwater monitoring program is infeasible" (p. E-3). We believe that a groundwater monitoring program should be

6.1 required; the suggestion that it may not be feasible to monitor ground-water impacts does not seem appropriate for a project of the magnitude of the Riley Ridge project. A suitable monitoring program may, of course, require a thorough study of the hydrogeology of the project area. The gaps in hydrologic information repeatedly stressed (e.g., p. 2-10, 2-11, 4-37, 4-135, E-3) are unfortunate; however, we believe that for a project of such great scope and duration the effort to conduct hydrogeologic studies on which to base monitoring would be justified.

6.2 Additional studies also should consider ground- and surface-water interrelationships, especially where the potential for surface-water degradation may result from the migration of contaminated ground water. Such migration may come from accidental failure of well-field reserve pits (p. 4-35), evaporation ponds (p. 4-37), or construction camp sites (p. 4-85).

James F. Devine

Responses to Comment Letter 6

6.1 Thank you for your comment. As you have noted, one of the major problems in designing a groundwater monitoring plan is the lack of necessary baseline information. The BLM and FS will continue to evaluate groundwater data needs and modify and refine the monitoring program as is appropriate. See Appendix E-1 of this FEIS.

6.2 The groundwater and surface water monitoring plans contained in the final EIS address the degradation of water quality resulting from the migration of contaminated water or the failure of reserve pits or evaporation ponds.

July 1, 1983

Statement of Concern: Riley Ridge Gas Project Draft EIS

On June 29, 1983, during the Open Mike program on KMER, an oil industry representative made the statement that SO_2 emissions from a Sour Gas sweetening plant was no more, and sometimes less, than coal fired electrical generating plants. I disagree with this statement.

My family and I live 9 miles south and east of Kemmerer, 1/2 mile south of Waterfall. In the 3 years that I have lived at this location, we have never smelled UP&L's Naughton Plant. There have been several occassions that the emissions from this plant have been blown directly over us, with no apparent smell. We have also on several occassions, smelled the FMC coke plant. It has a very distinct odor.

We have smelled, on four occassions, the Whitney Canyon or other plant when the wind has been out of the SW. Twice we have been forced inside, and were still able the smell the sour egg inside our home. On one occassion, the smell was so strong that it woke the entire family out of a sound sleep.

I bring this up because I believe not

enough is being done at the sweetening plants
7.1 to scrub the SO_2 out of the air. I fear additional plants will only make the matter worse, unless stricter air quality controls are imposed. I fear for my family because when you can smell it, you are OK, it's when you can't smell that you are dead.

I was born in Wyoming and have lived in Kemmerer since 1966. I firmly believe in the developement of our natural resources and support the Riley Ridge project. I would like to see the plant built east of Opal. I also firmly believe that this development can be done, not at the expense of nature, but in cooperation with nature. Let's not be afraid to use the available technology because it might lower the overly-gross profit margins of the oil companies; and that the writers of this and other EIS's overlook such matters because they will offend the high + mighty oil company executives and the writer's superiors (a sometimes questionable title).

Edward H Farley

Response to Comment Letter 7

7.1 Odor impacts would be caused by H_2S and not SO_2. All gas treatment plants associated with the Riley Ridge Project would be required to comply with all applicable air quality standards, including those for H_2S. Odor impacts are discussed on page 4-45 of the DEIS, and significant impacts are expected to occur only in areas of high terrain near the plant sites. No populated areas are expected to be affected. Please see Response to Comment 18.3 for a more detailed explanation of air permitting.

Comment Letter 8

United States Department of the Interior

BUREAU OF RECLAMATION
UPPER COLORADO REGIONAL OFFICE
P.O. BOX 11568
SALT LAKE CITY, UTAH 84147

IN REPLY REFER TO: UC-150

120.1

JUL 13 1983

Memorandum

To: Mrs. Janis VanWyhe, Riley Ridge Project Leader, Bureau of Land Management, Division of Environmental Impact Statement Services, 555 Zang Street, First Floor, East, Denver, Colorado 80228

From: Regional Director
Bureau of Reclamation

Subject: Review of Draft Environmental Impact Statement on the Riley Ridge Natural Gas Project (DES 83-34)

We have reviewed the above document and have the following comments to offer:

General

8.1 The Bureau of Reclamation's Big Sandy River Unit should be discussed in more detail under interrelated projects and cumulative impacts. It would appear that there is some potential for coordinating pipeline corridors, thus reducing environmental effects. Maps of the Big Sandy River Unit have been previously furnished the District Manager in Rock Springs for review and comment and should be used when considering the Riley Ridge Project.

8.2 Land requirements for facility construction (i.e., well sites, plantsites, access roads, pipelines, etc.) in the proposed action and related alternatives will involve Bureau of Reclamation lands. Any surface activities upon Bureau lands must be coordinated with the Bureau of Reclamation prior to entry in order to insure the appropriate land use license, easement, and/or permit is issued.

8.3 In view of the acknowledged data gaps regarding ground water and surface water, the statement gives a fair assessment of water resource and potential salinity impacts. We remain concerned, however, with the generalized potential of pressurized saline water escaping from the 100 to 200 gas and/or injection wells to be drilled in the area. Recent experience with a nearby study area (Big Sandy River) has demonstrated the presence of saline ground water aquifers associated with known formations and faults or folded geologic areas. While we agree that specific salinity impacts cannot be quantified at this time, this reinforces the need to define an adequate surface and ground water monitoring system. The general considerations for ground water monitoring are

8.4 presented in Appendix E. These "considerations" need to be translated into a regional and site-specific monitoring system showing locations of stations, measurement strategy, etc. The same information should also be supplied for the surface water monitoring. Map 3-4 shows the location of some existing streamflow and water quality sampling locations, but it is not known if any of these are included in the monitoring plan.

Specific

8.5 Map 1-8 - The Big Sandy River Unit includes the Big Bend of the Big Sandy River. This would be the location of the collector well field. From there saline water pipelines would go to the proposed Chevron Plant southeast of Rock Springs and to the Texasgulf Plant west of the Green River.

8.6 In table 1-19, Chapter 1, "Interrelationships with Other Planned or Proposed Projects," specific changes need to be made. The Big Sandy River Unit of the Colorado River Water Quality Improvement Program would develop 12,000 acre-feet of saline water for industrial use by Chevron Chemical Company and Texasgulf Chemicals, Inc. An estimated 7,000 acre-feet would go to Chevron. This would reduce the amount of fresh water that Chevron would obtain from the Green River. The peak construction force for the Unit is estimated at 77 in the year 1989. The operation water requirements should be 12,000 acre-feet, not 25,000 acre-feet. An estimated 933 acres would be used for Unit construction - approximately 33 acres for permanent features, and 900 acres for pipeline routes and other features that would be revegetated.

8.7 On Page 1-53, the Big Sandy Salinity Project is mentioned as a potential project water supply, but would not be available until 1989; consequently, it was eliminated from consideration. While Big Sandy water may not be available until 1988-89, sufficient water would be available to meet most of the project needs (up to 15,480 acre-feet per year) and some of the delivery distances would be reasonably short (about 40 to 50 miles). If any delays are experienced with the Riley Ridge Project, a water supply from the Big Sandy River Unit should be reconsidered.

8.8 Page 4-29 - Chevron plans to use water from Fontenelle Reservoir. This water would be released from Fontenelle and later diverted from the Green River.

The statement is made that the Chevron Project would increase salinity concentrations at Imperial Dam by 1 mg/l. Reclamation's comments on the Bureau of Land Management's Chevron draft statement should be referenced. We estimated the increase at 1.9 mg/l. This comment also applies to the Cumulative Impact discussion on page 4-38.

8.9 Finally, it is noted that the project will provide a new source of CO_2 at a rate of 1.5 billion cubic feet per day. Such a large reserve of CO_2 will probably be considered as a candidate source for the Aquatrain project. Under the Aquatrain project, a liquid CO_2 coal and saline water pipeline system is expected to be under study in the same area of southwestern Wyoming.

We appreciate the opportunity to review this environmental statement.

cc: Commissioner, Attention: 150

Responses to Comment Letter 8

8.1 The purpose of the interrelated project section is to present data on other projects which may occur in the same time span as the Proposed Action, or in some fashion create impacts that overlap in time or space. If overlapping impact does not occur, then no description is needed of the project.

The Rock Springs district manager is aware of the Big Sandy Project and will consider the potential for common pipeline corridors in the final decision making process.

8.2 This is noted in Table 1-1, Authorizing Actions, on page 1-5 of the DEIS.

8.3 A baseline surface water monitoring program for the well field has been completed. Data and analysis of data has been presented to the BLM, FS, and applicants. A monitoring program during construction and operation has been defined on the basis of the baseline results and is included as Appendix E.3 of this final EIS.

The effects on groundwater of deep well reinjection of wastewater from the sour gas treatment plants and well field dehydrators have not been fully analyzed due to lack of information on the applicant's injection engineering plans and specific water resources data. Prior to allowing this activity on or off the proposed plant sites, the BLM will require further analysis of impacts. In addition, the Wyoming Oil and Gas Commission, Wyoming Department of Environmental Quality, and BLM-Minerals Division must review and approve the applicants' disposal plans. The necessary permits or approvals would be required before the applicants could begin drilling new reinjection wells or injecting in old oil or gas wells. All applicable measures contained in Appendix B of the DEIS must also be complied with.

8.4 Ground and surface water monitoring programs have been developed and are included in this FEIS.

8.5 Map 1-8 is only a general location map and was not intended to show much detail. The Rock Springs BLM district does have detailed maps which will be used in the final decision making process.

8.6 The numbers shown in Table 1-19 on page 1-54 of the DEIS were taken from the Chevron EIS and rounded up. The largest possible water use and employment figures were used to give "worst-case" cumulative impacts.

8.7 By the time the Riley Ridge Project is actively developed, Big Sandy water may be available. At that time the companies may then consider it as a possible source.

8.8 Recent model runs do show a possible increase of 1.9 mg/l. The text on page 4-29 of the DEIS has been corrected, see Errata Summary.

8.9 Preliminary studies on the Aquatrain project are just getting under way and the Riley Ridge supply of CO_2 will indeed be studied as a possible source.

Comment Letter 9

City of Green River

Planning and Zoning

July 12, 1983

Mrs. Janis VanWyhe
Riley Ridge Project Leader
BLM Division of Environmental
Impact Statement Services
555 Zang Street
Denver, CO 80228

Dear Mrs. VanWyhe:

The City of Green River has reviewed the Riley Ridge Environmental Impact Statement and would like to make the following comments.

The City concurs with the Agency Preferred Alternative based on the information that has been made available. This concurrence is based on the belief that a) the socioeconomic impacts would occur in areas where they can optimally be handled, and, b) the Shute Creek alternative would have the least amount of overall negative impacts. The City does, however, remain concerned about the
9.1 project's impact on recreational areas west of LaBarge and Big Piney which are used by Green River residents. In this regard, the comments made by Sweetwater County Representative Jim Roth at the June Public Hearing in Rock Springs deserve careful consideration. Specifically, the potential conflict between emissions from the processing facilities and recreational uses may deserve additional review. Mr. Roth's comments concerning the classification of roads and the reclamation of existing roads deserve consideration as well. While the projects may not directly be responsible for the existing roads in the area, limiting the cumulative impacts by attempting to reclaim the existing thoroughfares may not be unreasonable. Additional work by the firms and the BLM on road reclamation may be appropriate.

The City appreciates this opportunity to comment on the EIS and will look forward to ongoing cooperation with the BLM on similar endeavors.

Respectfully,

S. Wells Williams
City Planner

SWW:cw

City of Green River / 50 East 2nd North / Green River, WY 82935 / (307) 875-5000

Response to Comment Letter 9

9.1 Thank you for your comment. The BLM and FS are also concerned about potential impacts to recreation resources and will monitor any effects to campgrounds and recreation areas on federal lands caused by the Riley Ridge Project and adjust their normal management activities as necessary. Impacts on state and county recreation areas will be reviewed by the Industrial Siting Administration and appropriate mitigation measures will be developed as part of their permitting process

Comment Letter 10

GREEN RIVER
(307) 875-2611 EXT. 270

ROCK SPRINGS
(307) 362-7870 EXT. 270

SWEETWATER COUNTY PLANNING DEPARTMENT
P. O. BOX 791
GREEN RIVER, WYOMING 82935

July 13, 1983

Mrs. Janis VanWyhe
Riley Ridge Project Leader
Bureau of Land Management
Division of Environmental Impact Statement Services
555 Zang Street
First Floor, East
Denver, CO 80228

Re: 1792 (934)
Riley Ridge

Dear Mrs. VanWyhe:

At our July 12, 1983, regular meeting, the Sweetwater County Planning and Zoning Commission of Wyoming reviewed applicable portions of the Draft Environmental Impact Statement for the Riley Ridge Natural Gas Project.

Our Commission offers the following comments:

ONE: This project should be encouraged since direct employment of 3,000 workers in 1985 would contribute to the local economies of Lincoln, Sublette, and Sweetwater Counties presently suffering high unemployment.

TWO: There are two proposed facilities which may adversely affect Sweetwater County. They are:

10.1 A. A portion of the proposed route for a sales gas pipeline of American Quasar and Exxon would be located at the base of White Mountain just north and west of the City of Rock Springs. This route

10.1 (cont.) may be a constraint to existing and proposed residential development and other land uses. In addition, once a utility easement is located, there remains the possibility of its potential expansion into a utility corridor of several pipelines. We recommend that there be further investigation into the possibility of re-routing this pipeline away from the sensitive White Mountain area.

10.2 B. As an alternative means of sulfur transport from the sour gas plants, a proposed rail line was identified to be constructed in Sweetwater County. We recommend that different alternate routes be considered rather than transversing Seedskadee National Wildlife Refuge.

10.3 THREE: The statement did not adequately address the proposed State Highway construction of a road beginning at the junction of State Highway 191 and 28 (Farson) westward to La Barge Road. The time frame for this construction may affect the future traffic and settlement patterns of this project. We recommend further study.

On behalf of our Commission, may I express my appreciation for the opportunity to comment.

Sincerely yours,

Robert A. Volcic

Robert A. Volcic, Chairman
Sweetwater County Planning
and Zoning Commission

RAV/jcf

CC Board of County Commissioners of Sweetwater County

Responses to Comment Letter 10

10.1 Thank you for your comment. Your concern with the proposed pipeline alignment near White Mountain will be taken into consideration during the processing of the Right-of-Way Application.

10.2 Thank you for your comment. It will be considered in the final decision making process.

10.3 The proposed highway will provide ready access to north-central Wyoming, especially for residents of the Kemmerer area. The State Highway Department could begin construction as early as next summer but still needs clearance from the Bureau of Reclamation. Work on the road would not be complete for at least another two years and even when finished is not likely to affect the settlement patterns of Riley Ridge workers (A. V. DeBernardi, Wyoming State Highway Department, personal communication with P. Fleischauer, August 22, 1983). Given the still uncertain timing for completion of this road and the conservative analytical approach that was pursued throughout the DEIS, the transportation and socioeconomics analyses have not included consideration of this highway.

Comment Letter 11

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
Atlanta GA 30333
(404) 452-4257
July 12, 1983

Mrs. Janis VanWyhe
Riley Ridge Project Leader
Division of Environmental Impact
Statement Services
Bureau of Land Management
555 Zang Street
First Floor, East
Denver, Colorado 80228

Dear Mrs. VanWyhe:

We have completed our review of the Draft Environmental Impact Statement (EIS) on the Riley Ridge Natural Gas Project, Sublette, Lincoln, and Sweetwater Counties, Wyoming. We are responding on behalf of the U.S. Public Health Service.

11.1 Provision of construction work camps would help relieve the demand for single housing throughout the project. However, additional measures to induce developers from outside the region to produce housing may be required to fully meet the projected housing demand if this project is implemented (C4-131). The absence of adequate housing could result in an unquantifiable amount of temporary occupancy. We believe that adequate housing is essential for maintaining good health, and this subject should receive more attention within the "health and safety" section of the Final EIS.

11.2 Relative to housing are the critical needs of adequate sewage disposal, solid waste disposal and water supply. These issues should be addressed in the health mitigation section.

11.3 Also, we are concerned with the location of new residents due to the hazards posed by this project. Local zoning authorities should be consulted regarding safe restrictions on housing development, whether they are considered temporary or long-term.

11.4 Significant impacts to human health and safety could result from the release of H_2S during well drilling (blowouts) or pipeline leaks or ruptures. Because H_2S is extremely toxic, the potential frequency of an accident is critical. Analysis has indicated a potential for 2.8 well blowouts during the life of the project (30 to 40 years). Potential impacts to the general public within one-half mile during an accident would be "roughly equivalent to the U.S. automobile death rate." Persons living within 1 to 2 miles from the accident site would be exposed to "a risk equivalent to the U.S. 1978 fire and burns death rate." These are mortality comparisons at H_2S levels of 1,000 ppm and 100 ppm, respectively. These mortality comparisons are very serious when one considers the tremendous impact automobile accidents and fires have upon American mortality rates. The

Page 2 - Mrs. Janis VanWyhe

11.4 (cont.) DEIS did not mention morbidity. The threshold for serious eye injury is 50-100 ppm by volume. The current National Institute for Occupational Safety and Health recommended standard for occupational exposure is 10 ppmv for a 40-hour workweek, with the requirement of evacuation if the concentration exceeds 50 ppmv. Therefore, in addition to a worse case event, we suggest that a discussion be included in the Final EIS on potential low-dose effects of H_2S, including morbidity implications and the nuisance aspect of H_2S odors upon acceptable work and living environments.

11.5 We believe sufficient mitigation plans have been addressed regarding H_2S leakage prevention, however, not for potential exposures. Although evacuation plans will be developed, they may not eliminate the possibility of some people being exposed to significant or lethal levels of H_2S. People at risk should be communicated with prior to making a decision on this project, and zoning authorities should be consulted regarding housing restrictions in proximity to hazardous areas.

11.6 Significant adverse impacts to surface water and ground water are possible during construction, operation, and abandonment procedures. Qualifications of these potential impacts cannot be made at this time "because of inadequate data on surface and groundwater characteristics and probabilities of the occurrence of contamination events." We note in the Draft EIS that all injection wells for plant waste water will need an environmental analysis prior to approval. This information should be summarized in the Final EIS if available. We recommend that the final statement also describe in detail the preferred monitoring program for both ground water and surface water. Recommended alternatives for monitoring ground water are presented in Appendix E. The agency responsible for coordinating these efforts should be noted.

11.7 Impacts to recreation due to the project would be significant and aggravated by cumulative development in the study area. Unfortunately, very little in the way of mitigation can be implemented due to the type and duration of the proposed project. This change in the environment may be perceived by many of the residents as a reduced quality of life brought about by the proposed project. Have the local residents been informed about these related impacts?

11.8 With regard to the significant transportation impacts generated by the project (4-75), there is no mention of road improvement or repair responsibilities or action plans on the most concentrated routes where 140 more accidents per year are anticipated. The other transportation improvement measures described on page 4-138 appear to be adequate.

In conclusion, the intensified energy related changes in the Big Pinery project area will create significant impacts, some of which are irreversible, to an area that is now appreciated for its scenic and natural features. We are concerned about these changes but particularly where these changes may impact upon human

11.9 health. If this project is approved, we encourage the implementation of every appropriate safeguard and mitigation procedure in an effort to minimize potential health threats. In addition, we recommend that the monitoring plans, when implemented, be carefully reviewed and data analyzed on a frequent basis by a

11.10 pre-established review panel of responsible persons. We recognize that the oil

and gas resources in the area are extensive and the commitment to extract them is fostered by our country's need for natural gas. However, mitigation possibilities for the anticipated "trade-offs" should be thoroughly reviewed before a decision is made to proceed with the proposed project.

We appreciate the opportunity to review this draft statement. Please send us a copy of the final document when it becomes available. If you have questions regarding our comments, please contact Mr. Ken Holt of our staff at (404) 452-4161 or FTS 236-4161.

Sincerely yours,

Frank S. Lisella, Ph.D.
Chief, Environmental Affairs Group
Environmental Health Services Division
Center for Environmental Health

Responses to Comment Letter 11

11.1 Housing and related services are addressed in the Socioeconomics section of the DEIS and the Socioeconomics Technical Report where those factors, used in their derivation such as employment and population, are presented along with estimates of revenues and expenditures which indicate local ability to provide needed services. Placing these related topics within one section facilitates understanding the analysis that was performed.

11.2 Funds to pay for sewage disposal, solid disposal, and water supply come from the responsible county or city government. To understand a community's ability to respond to increased public service needs, a comparison must be made with their ability to generate revenues. Such a comparison of service needs and funds to pay for them is facilitated by addressing both issues in the same section of the EIS and not split as they would be if service needs were addressed in the Health and Safety section. For this reason, the Health and Safety section of the DEIS deals exclusively with the risks to the local population from an H_2S release. All other health-related issues are presented in juxtaposition with the revenue and expenditure analysis.

11.3 The Health and Safety section of the DEIS (page 4-33) summarizes the risks associated with an accidental release of sour gas. Should a release occur, lethal doses could be experienced within 0.5 mile of a well, within 3 miles of a trunk line, and within 4 miles of a gathering pipeline. Using these modeling results and the final configuration of wells and pipelines, planning boards can identify and, if desired, zone accordingly, areas where restriction of residential development would be appropriate. Any future development then would have to conform to the board's zoning regulations.

11.4 A discussion of the non-lethel effects of H_2S can be found in Chapter 1 of the Health and Safety Technical Report. Discussions of the odor impacts of H_2S can be found on pages 4-45, 4-91, 4-108, and 4-123 of the DEIS and pages 2-12, 2-13, 2-44, 2-62, 2-80, and 2-98 of the Air Resources Technical Report.

11.5 Map 2-1 in the FEIS shows the populated areas and sensitive receptors in the vicinity of the sour gas trunk lines.

People at risk have been informed of the project by means of the public scoping meetings, DEIS, and public hearings. Sensitive receptors that could be exposed to lethal levels of H_2S in the event of a pipeline rupture will also be supplied with copies of the FEIS. County zoning authorities are aware of the project and would be responsible for any zoning changes which would restrict the construction of businesses or homes in the vicinity of a sour gas trunk line. DOT also requires that signs be installed along the right-of-way to mark the location of the pipeline.

11.6 Significant adverse impacts to surface and groundwater are possible, but are not necessarily probable, if the proper construction, operation, and abandonment procedures are followed (see pages 1-16 to 1-40 in the DEIS).

Environmental analysis required for injection wells would be part of the permits required by the Wyoming Oil and Gas Commission and Wyoming Department of Environmental Quality which are summarized on pages 1-8 to 1-9 and 4-36 of the DEIS. Detailed information on the injection wells is not available.

The surface water baseline monitoring program is described in this Final EIS Appendix E-3. Appendix E-1 in the FEIS describes the groundwater monitoring program and identifies the agencies which should be involved.

11.7 Public input to the preparation of an EIS and subsequent reporting of the results of the impact assessment are key components of the EIS process. In keeping with this process, the Riley Ridge DEIS has been circulated to public agencies for review, public hearings have been conducted, copies of the DEIS and Technical Reports have been placed in all the libraries, and the final EIS will be on file at agency offices in the study area. Among the agencies involved in both preparation and review of the document are those that have responsibility for management of recreation resources in the project area. Through a combination of the company-committed mitigation measures, the awareness of the agencies of possible problems, and the public's understanding of the project's anticipated impacts, the impacts, while real, should be largely short term in nature and result in no long-term degradation of the quality of life.

11.8 Road repairs and improvements are undertaken on an as needed basis. The EIS, as well as the state highway and county road use permit processes, serve to alert the responsible agencies to where repairs and/or improvements may be necessary and should be incorporated in their maintenance efforts. Accident estimates reflect the estimated number of vehicle miles associated with the project and the average accident rate on a particular class of highway throughout the state. Given that it is not expected that road classifications would change during project construction, accident control would be realized through a variety of temporary measures, not permanent improvements. See specifically mitigation measure T-5 on page 4-138 of the DEIS.

11.9 Thank you for your comment. It will be considered in the final decision making process.

11.10 Thank you for your comment. It will be considered in the final decision making process.

Comment Letter 12

Upper Green River Chapter
TROUT UNLIMITED
Robert Garrett, President
P.O. BOX 909
Pinedale, Wyo. 82941

Janis VanWyhe, Project Director
Bureau of Land Management
Division of EIS Services
555 Zang Street - 1st Floor East
Denver, Colo. 80228

Dear Ms. VanWyhe, Project Director:

We of the Upper Green River Chapter of Trout Unlimited are extremely concerned about the impacts of the Riley Ridge Project. Our concerns are twofold: the first involves the large emissions of SO^2 and NO^X gases from the plants; secondly, the effects on the area's fishing environment by a producing gas field and plants as well as increased population.

There are approximately 2,000 lakes in the Wind River Mountain Range which encompasses the Bridger Wilderness. Most of these lakes are located in glacial scoured pockets nestled in granite rock structures. These types of lakes hold extremely pure water with very few minerals being leached from the soil. They have virtually no buffer zone against increased acidity. To us of the Upper Green River Chapter of Trout Unlimited there is no question that the levels of SO^2 and NO^X emitted could cause acid rains in the Bridger Wilderness as well as the surrounding areas.

12.1 Whether or not the emissions from the one remaining plant (Exon's) still on schedule could kill these high country lakes or not is a scientific gray area. What is not a gray area is that a large amount of the gas from Evanston north through the Wyoming Range of mountains is sour. In a long range overlook, this means there will be more sour gas plants or that the capacity of the present ones will be increased. This production we feel will definitely have an effect on the acidity of the lakes in the Wind River Range.

12.2 Obviously, acidifying the lakes would have a detrimental effect on the ecosystems of the lakes. Of these, over 600 lakes have fish. What is not so obvious is the adverse effect that the killing of these lakes would have on local tourist trade. Of the 30,000 people who use the Bridger Wilderness each year, two-thirds of them come to fish. If we use the figure of ten dollars per person spent in the community, the killing of these lakes could deprive the community of Pinedale of $200,000.00 of outside money. This figure does not include the money that the various outfitters gain from use of the Wilderness, or the additional fishing days on the base lakes (such as Fremont) and streams in the area. These lakes and streams could also be affected by acid rain. All in all, the economic effect could be disastrous.

12.3 Our second point of contention concerns the activities around the plants and gas pipelines themselves. Gas spills, although unplanned, have a detrimental effect on fish if, they are located in close proximity to each other. We would hope that every effort is made to minimize these impacts. One species, the Bear River Cutthroat, cannot afford any impact. It is found only in this area! With the increases in population, also comes an increase in fishing pressure. We would like to see a joint venture with the Wyoming Game and Fish and the various gas companies to explore the possibilities of ways to minimize this pressure.

We are not suggesting that these plants not be built. We would only require that they clean up their emissions. The National Research Council, an arm of the National Academy of the Sciences, has suggested that 50% reductions in SO^2 emissions can help control acid rains. We feel that a 50% reduction of the SO^2 and NO^x emissions now proposed should be a minimum requirement of each plant. Secondly, we feel a larger number of lakes in the Bridger Wilderness should be monitered. It has been found in other parts of the world that lakes located close together in seemingly the same environment can be affected in totally different manners. Since we are dealing in an area of unknowns, we need to broaden the study area.

12.4

12.5

Even though the various gas companies may complain about the additional costs that these precautions will incur, in the end it will be us, the populace, that will pay the price. Once destroyed, these lakes are not reclaimable. We can afford the higher price of gas.

Sincerely yours,

Robert S. Garrett

Robert S. Garrett, president
Upper Green River Chapter
TROUT UNLIMITED
And the Board of Directors
Dave Nichols, Vice-president
Bruce Edwards, Sec.-Treas.

Members-at-large of Board
Andrew Pfaff
Don Post
Floyd Oxner
Elaine Garrett
Ron Remmick
Jack Cain

Responses to Comment Letter 12

12.1 Emissions of SO_2 from future (not yet proposed) gas treatment plants in the Evanston, Wyoming Range, or Riley Ridge areas could increase the acidification of lakes in the Wind River Range. It is not possible to quantify this increase or predict when it might occur.

12.2 This scenario is speculation; however, if fish in lakes within the Bridger Wilderness were killed by lake acidification, adverse economic effects in the Pinedale area would result.

12.3 The sour gas trunk lines have been designed to prevent leaks or ruptures. Potential impacts from the accidental release of H_2S into a stream are discussed on pages 4-28 and 4-29 of the DEIS. The Bear River cutthroat trout is found in the Bear River along the Wyoming-Utah border. This stream would experience a smaller increase in fishing pressure than the streams within the Riley Ridge well field. Any new management plans responding to increased fishing pressure on the Bear River cutthroat or Colorado River cutthroat in the well field would have to be developed by the Wyoming Game and Fish Department.

12.4 Sulfur control for the Riley Ridge gas treatment plants would range between 99.4 percent (Northwest) and 99.8 percent (Exxon). The control technologies used to achieve these results would be reviewed by the Wyoming Department of Environmental Quality as part of the PSD permitting process (see page 1-13 of the DEIS). It is unknown at this time whether the applicants will be required to achieve greater sulfur control.

12.5 The FS has developed an acid deposition monitoring program within the Bridger and Fitzpatrick Wildernesses. This program will monitor areas which are deemed to be the most sensitive to acid deposition so that potential adverse effects of acid deposition will be predictable and observable as soon as possible. This plan is presented in Appendix E-2 of the FEIS.

Comment Letter 13

July 14, 1983

To: Janis L. VanWyhe, Division of EIS Services
First Floor East
555 Zang Street
Denver, Colorado 80228

Re: Comments on the Riley Ridge Project

I am a rancher in the area where much of this our gas is located in Sublette County. My ranching interests are directly affected by the presence of these wells. I live eight miles north of LaBarge, Wyoming. it is just off from highway 189. These wells are sprinkled throughout the public lands that are used by me for the purpose of grazing my livestock in the summertime.

I am concerned about moving the gas so far as proposed in the larger lines by Northwest. I note that there is a greater danger problem in the system as proposed by Quasar and Northwest. I Feel that the smaller lines would pose less of a
13.1 hazard to the livestock. I notice that the movement of livestock was not taken into consideration. I noticed with interest that the fences and grazing areas will be protected.

13.2 In reviewing this draft EIS of the Riley Ridge project, I feel that it will definitely benefit this country. However, with the influx of people into the area, the poaching problem and the butchering of beef will certainly be magnified.

I also feel that with the safety precautions that are being taken in the developement of these projects are more than adequate and the companies are going that extra mile.

13.3 I couldn't help but notice that several of the streams that are listed with fish are often dry during dry years. For example, Black Canyon and the Upper part of Dry Piney Creek. I have lived here for sixty five years and being a rancher riding these ranges, I have been in every nook and crany of it.

13.4 One thing that really interested me so much was how much of the EIS statement was taken up in addressing the concerns of wildlife, whereas little is spent evaluating the concerns of agriculture in the area involved. Yes it was addressed but not in the same manner as was the fish and game interests. No rancher involved was consulted for some input! Why?

In conclusion, after reading this statement of the Riley Ridge Project, I feel that the Big Mesa plan to be the most feasable plan. I have some concerns about the other plans.

I feel that I endorse the orderly developement of the sour gas plants here in Sublette County.

Sincerely,

Walter C. Yose Jr.
Box 94
LaBarge, Wyoming 83123

Responses to Comment Letter 13

13.1 Potentially significant impacts to sheep herding are noted on page 4-66 of the DEIS. The potential for other unquantifiable but significant impacts to livestock are noted on page 4-68.

13.2 Thank you for your comment. The increase in potential game violations, poaching and wanton killing, and livestock harassment and rustling were acknowledged in the impact assessment (Chapter 4) on page 4-16 in the DEIS.

13.3 Information provided by the Wyoming Game and Fish Department shows that fish do occur in Black Canyon and Dry Piney Creeks. Even though certain reaches of these creeks cease to flow during dry periods, enough pools and beaver ponds exist to provide habitat for fish. The upper reaches of the creeks are also less prone to drying-up than the lower reaches.

13.4 The EIS process traces concerns and impacts in all disciplines to the point where they are significant or insignificant. Presentation of results in the DEIS focuses on those impacts that are classified as significant. Although impacts were predicted for agriculture, when compared to the significance criteria they were classified as insignificant.

Public input, including rancher input, has been provided for through public meetings, input from the Rock Springs District Advisory Council (which includes representatives of the ranching community), and opportunity to submit written comments on the DEIS, as you have chosen to do.

Also see Response to Comment 16.4.

Comment Letter 14

Carr's Appliance & True Value Hardware

Boyd or Maicille Carr
Box 588
Big Piney, Wyoming 83113

July 12, 1983

Mrs. Janis VanWyhe
Riley Ridge Project Leader
Bureau of Land Management
Division of Environmental Impact Statement Services
555 Zang Street
First Floor, East
Denver, Colorado 80228

Dear Mrs. VanWyhe:

I am a businessman in Big Piney, Wyoming. I have studied the DEIS, Riley Ridge Project and submit the following comments.

I was a novice attendee at the scoping meeting held in Big Piney, and I believe after reading the DEIS that the attendees were unfairly led to identify the concerns of the BLM and the FS, and not the concerns of the residents of Sublette County in general. In my view, the beneficial aspects of the Riley Ridge Project were not sufficiently addressed at the scoping meetings. At the scoping meeting citizens were asked to identify their concerns related to the Project and naturally we wanted to know about the safety factors and how our air and water would be affected. From studying the DEIS it appears that the companies involved are being required to comply with all the concerns of all the citizens. I could hardly believe that any company could be required to go through the approximately seventy permitting processes listed in the DEIS. I'm surprised they haven't invested totally in Mid-East oil.

In my view, the principles on which this nation were founded, namely free enterprise and individual initiative are being violated in this DEIS by unnecessary beaurocratic intervention. I support the concept that our environment should be preserved, but that should not be construed to mean that it will never change. The nation's need for a self-sufficient supply of energy to meet the needs of its people and industries should be a prime consideration of all Americans, and certainly of those who are in a position to approve or reject the project.

14.1 *In Chapter 4, we are told how much land will be visually or culturally impacted. I could find no mention of the percentage of land that will not be affected. For example, page 1-21 points out the number of acres disturbed for the Proposed Action. Do access roads consume 757 acres or cross that number of acres? Do pipelines consume 4,790 acres or cross that number of acres? Should certain changes in the landscape be construed as impact simply because they represent change? I do not object to a telephone or power line or pipeline or road if they provide a service essential to the needs of the people. A balance must be achieved between our energy needs and at the same time adequately protecting our environment.*

Page 2

Comments on Riley Ridge Project

We have operated Carr's True Value Hardware since 1974. In 1978, our business had increased largely as a result of gas and oil activity, that we financed and built a new store building which offers the community a reasonably complete line of hardware and home-related products. We welcomed that patronage from the companies and the support services that accompany the gas and oil activity and continue to do so. Our accounts that relate to the petroleum industry have dropped drastically in the past year, and we will be hard pressed to provide the community with the service we believe we have furnished over the past several years, or even to stay in business at all.

14.2 I disagree with the statement on page 3-15 regarding the domination of agriculture in the economy of the region. What documentation was used to support that statement? It was activity in the petroleum related sector that motivated us to build the new store building. Furthermore, statistics released by the county treasurer show that the petroleum industry pays in excess of 80% of the tax revenue in Sublette County. According to the most recent statistics released, however, this trend is declining, indicating a depletion of known produceable reserves.

I urge you to consider the economic needs of the people of Sublette County in the decision-making process and go on record as being in support of the Proposed Action for the Riley Ridge Project.

Very sincerely yours,

Boyd Carr

Boyd Carr
Carr's Appliance and True Value Hardware

Responses to Comment Letter 14

14.1 The number of acres in the Riley Ridge Project area that would not be affected by the project was not calculated because it was not deemed pertinent to impact analysis. The acreages presented in Table 1-8 on page 1-21 of the DEIS would be disturbed by the project construction or occupied during project operation. It is not clear what the commenter means by "consume". Impact analysis was conducted for several disciplines; this allowed the difference in impacts resulting from disturbance or "change" to be assessed. Disturbance of a given number of acres may be significant for grazing or wildlife but not significant for cultural or visual resources.

14.2 On page 3-15 in the DEIS it is stated that during the 1970s agriculture continued to dominate the economy of Sublette County. As indicated in Table 3-2 on page 3-4 of the DEIS, in 1970 the agricultural sector provided more jobs than any other economic sector, accounting for approximately 24 percent (476/1,956) of the county's employment opportunities. This dominance continued throughout the decade. As of 1980, the agricultural sector still provided more jobs than any other sector in Sublette County (467 out of a total of 2,408).

Comment Letter 15

Box 396
Big Piney, Wyoming 83113
July 12, 1983

Mrs. Janis VanWyhe
Riley Ridge Project Leader
Bureau of Land Management
Division of Environmental Impact Statement Services
555 Zang Street
First Floor, East
Denver, Colorado 80228

Dear Mrs. VanWyhe:

As a member of the Town Council of Big Piney, I support the location of the Riley Ridge sweetener plants in Sublette County. The petroleum industry has been most beneficial to our county in the past, and, I believe, will continue to be in the future if given the opportunity. I further believe that this opinion is representative of the views held by the majority of the citizens of this community. The sharp decreases in drilling activity during the past year have caused many of the residents of Big Piney and the outlying areas to recognize these benefits which we have all perhaps taken for granted previously.

The petroleum industry has stimulated our economy, provided a strong tax base, and most of all has brought many fine citizens into our community who have established their homes here and would like to continue to live here. They include engineers, geologists, nurses, teachers, retail merchants, welders, oil field services, etc. We have an excellent school system, largely as a result of the industry. I can think of no long term detrimental effects of the industry's presence to our town or county: rather, I believe our quality of life has only improved as a result.

The Town is in a strong position to handle the related impact from the Riley Ridge Project. In cooperation with the EPA, the sewer lagoon will be enlarged and necessary lines replaced with completion of this project scheduled for the early 1980's.

Our Police Department is one of the best in the state, with only well-trained, certified officers and all the equipment needed to operate efficiently and professionally. At our most recent meeting authorization was given for additional training for our Municipal Judge in order to promote our dedication
15.1 to quality police enforcement. The DEIS does not address quality, but only quantity. (Paragraph 2, page 3-12) It is my sincere belief that when the need for 24 hour protection arises, it will be implemented. Additionally, our Volunteer Fire Department is well-organized and trained and has the most modern equipment available anywhere. Here again, no effort appears to have been made in the DEIS to address quality. Certainly this aspect of a community's services deserves to be considered.

Comments, DEIS, Riley Ridge Project

15.2 Paragraph 1. page 3-7, states, "Big Piney has relatively little developable land within its present boundaries." I would like to point out that the Landa's Landscape Annexation is now totally in place for development, with adjacent areas being planned for when the need arises. We are currently in the process of a subdivision ordinance which will provide for planned and orderly growth in the future.

15.3 In reference to the one percent sales tax, the Council has worked diligently for the passage of this measure in the past, and I remain committed to work toward this end. (Paragraph 2, page 3-13. We feel that progress has been made in convincing our citizens of the need for the tax, and I am convinced that it will again be on the ballot in 1984.

I appreciated the following comment from page 3-15: "The county appears, therefore, to have accomodated to the growth it has experienced, maintaining the standard of living of long-time residents and meeting the needs of newcomers." The Council welcomes the opportunity to continue working with the companies involved in the Riley Ridge Project, and wholeheartedly support the Proposed Action described in the DEIS.

Very sincerely yours,

Maicille Carr

Maicille Carr
Council Member
Town of Big Piney

CC: Exxon, USA
Mobil Oil Company
Northwest
American Quasar
Williams Exploration
Senator Malcolm Wallop
Senator Allen Simpson
Representative Dick Cheney

Responses to Comment Letter 15

15.1 The DEIS is a worst-case analysis. Ignoring quality and/or efficiency changes is not to suggest that they cannot or will not occur. Rather it recognizes that in their absence, changes in staff levels may be required and that if such additions are made, the local agency will experience increased costs.

15.2 Discussions with the Mayor of Big Piney during preparation of the DEIS indicated a concern for the availability of developable land, in part because of a sense that private individuals would be unwilling to sell land for residential development. To the extent that this is not the case and that annexation such as the Landa's Landscape Annexation occurs, the impacts identified would be diminished. The conservative approach of the DEIS must be consistent in using ordinances and services in place at the time of analysis or reasonably sure to be enacted. For this reason, the analysis for Big Piney did not consider annexation, but rather through the estimates of housing and demand demonstates the need for a subdivision if one was not already being prepared.

15.3 The analysis of fiscal impacts in the EIS is based on the existing tax structure. Absence of the 1 percent sales tax is identified as limiting the ability of Sublette County to take advantage of state energy impact assistance funds. If the tax is eventually approved some of the anticipated fiscal problems in Sublette County would not be realized.

Comment Letter 16

JF Ranch, Inc. % Jay McGinnis
Box 280
Big Piney, Wyo. 83113

Janis VanWyhe, Project Leader
Riley Ridge Natural Gas Project
555 Zang St. First Floor East
Denver, Co. 80228

Dear Mrs. VanWyhe,

After reading the Draft Environmental Impact Statement, I would like to offer the following observations:

The DEIS studies seem to indicate that grazing impacts will be insignificant in all areas of the project. I sincerely hope that this will be the case; however, in the event grazing impacts do occur in the construction and operation of this project, I feel that the permittees in these areas should be given some protection.

16.1 Some provision should be written into the mitigation measurers providing reimbursement by the oil companies for grazing losses such as permit cuts, and not being able to get out to the range to care for our stock in case of a problem with escaping sour gas. This happened to us two years ago when American Quazar "lost" a well in in this area. Also, what provision has been made by the BLM in case the grazing area is again polluted with sour gas and we are unable to gather cattle in the fall and our grazing permits run out? Are we in tresspass?

16.2 I would like to question the comment on page 4-68. The second paragraph on that page states that perhaps ranchers will have to offer higher wages to retain help. What if ranchers cannot afford to offer higher wages, especially in the face of grazing cuts? This paragraph also suggests increased mechanization. There again cost ~~is~~ has a very significant impact on all of us. ~~What~~ An apt translation of this paragraph would be that agriculture is expendable for the profit of Exxon.

Throughout the DEIS, visual impacts, odor impacts, etc. are addressed primarily in terms of recreational loss, and wildlife dis-

16.3 ruption. No consideration is given as to the impact on people working with cattle on the range--or the disruption of cattle grazing , or weight loss, which can have a distinct impact on our income.

16.4 In compiling the DEIS, were any ranchers using this range consulted? We may not be environmental experts, but we do have first-hand knowledge of this area. I feel that, as a group, ranchers are the only people directly involved who will suffer a real financial and esthetic loss, and yet we have received the least consideration in this action. I would like to see a provision written into this DEIS giving the ranchers involved in each grazing allotment some consultation capacity during the construction of this project. As an example, May and October are listed as months during which construction will occur. Cattle are always in the West Dry Basin and Big Mesa pastures during the last half of May and the first half of October making them the worst two months of the year for this type of activity. In the past, operators have shut in sour gas testing to allow us to move cattle for pasture rotation. Will this poicy continue? I can see instances where moving a pipeline 100 feet in one direction could greatly reduce grazing problems. Working with oil companies in this manner on private land has worked well.

In closing, I would like to state a preference for the Shute Creek Alternative Plan. It makes a lot of sense to have these plants in one area where they can be closely monitored, and keep them as far as possible from inhabited areas.

Thank you.

Gary McGinnis

President, JF Ranch, Inc.

Responses to Comment Letter 16

16.1 In accordance with the Grazing Administration regulation [(43 CFR 4110.3-2(6)] ..."While reduced grazing use is necessary to facilitate achieving multiple-use management objectives for the allotment, the authorized grazing use shall be reduced to the livestock grazing capacity. The difference between the authorized grazing use and the grazing preference shall be held in suspension".

Compensation or reimbursement by the oil companies for grazing losses on public lands cannot be required by BLM since the public lands involved would be devoted to a public purpose which precludes livestock grazing.

Your concern about being able to care for stock in case of escaping gas is equally shared by BLM and FS. In actuality there are already provisions for livestock operator notification. However, to ensure appropriate attention is given to this matter, mitigation measure H-3, page 4-134 of the DEIS has been revised. See the Errata Summary for this revision.

If a well blowout or pipeline rupture occurs and prevents cattle gathering, and grazing permits run out, then technically you would be in trespass. However, each incident would be handled on a case-by-case basis. If it is determined that a fee is justified, only the standard fee would be required for the additional forage consumed.

16.2 Impacts to individual ranch operations are hard to predict at this time. If those currently employed in the agricultural sector choose to keep their jobs because they enjoy the work, live nearby, or for any of a variety of other reasons, ranchers would not have to offer higher wages. If, however, they find that workers are leaving to take new jobs in the oil and gas industry and they cannot find satisfactory replacements at the former wage rate, then they may have to offer, either temporarily or permanently, higher, more competitive wages. This does not imply that agriculture is expendable for the profit of the gas industry. The agricultural sector could as easily lose workers to sectors that are expanding under baseline conditions (i.e., in the absence of the proposed project) and similarly face the prospect of paying higher wages to retain the services of current workers. See, for example, the growth anticipated in the government sector shown in Table 3-2 on page 3-4 of the DEIS.

16.3 As noted on page 4-68 of the DEIS, it is not possible to quantify a number of the impacts to agriculture. Particular attention is drawn to the effects on livestock due to increased human activity and the possible economic impacts to individual ranch operations. In the absence of the information necessary to quantify such impacts, the DEIS has noted in a qualitative manner these potentially significant impacts that cannot be quantified.

16.4 As stated in Appendix A, page A-2 of the DEIS, Public Involvement, input was received from many people during the public scoping meetings and after the scoping meetings. Also refer to Response to Comment 13.4.

Provision for rancher involvement and consultation with the companies will be added to the process for meeting requirements for federal rights-of-way (see page 1-12 of the DEIS), Application for Rights-of-Way. Specifically the Construction and Use Plan (CU Plan) will have the following section added:

- Livestock operator consultation (include measures that will be taken within each allotment to protect or avoid destruction of improvements, to avoid livestock harassment, trailing, gathering, etc. during construction and operation, and any other measures agreed to during operator consultation).

Also, within the well field area, during the BLM's processing of applications for permit to drill (APDs), consultation opportunity is provided during the on-site inspection. See pages 1-3 and 1-12 of the DEIS for a discussion of the process for issuing APDs.

As in the past, the policy of notifying and evacuating all humans from the area of influence during well testing will continue.

Comment Letter 17

Ms. Jan Van Wyhe, Riley Ridge Project Leader
BLM, Division of EIS Services
555 Zang St., First Floor East
Denver, Colorado 80228

July 15, 1983

Dear Jan,

Enclosed are some comments on the Riley Ridge DEIS. I am quite interested in the project to say the least. I've been observing the gas activity in the area and around Evanston since I moved here 6 years ago.

LaBarge is a town of about 250 people at present. Totally dependent on oil/gas related prijects. It houses 3 bars, 2 greasy spoon cafes, and an elementary shool. An impact like Riley Ridge will make the town go crazy. I'm actually looking forward to it, firstly because I feel LaBarge and the area is one of the last hold-outs in the wild west and I'm more than curious to be a part and observe its transformation if indeed the project goes through.Most of the local folks have itchy feet about it. It means dollars and cents only to them. Riley Ridge means dollars and cents to me in the Real Estate business too, but secondly in importance because I know that the demand on housing will be automatic. For my personal interest I have to work so much harder to be of service. I'm very sensitive to the whole worldly growth and know I, as you, am a valuable resource that wants to see as good a quality of life as possible for the entire environment.

Par coeur,

Carmen D. Hakola

CDH/ch
enc.

To: Bureau of Land Management
Division of EIS Services
55 Zang St., First Floor East
Denver, Colorado 80228

July 14, 1983

RILEY RIDGE NATURAL GAS PROJECT, DEIS COMMENTS

1. REVIEW

Review of the DEIS and accompanying technical reports offered extensive, informative data and analysis of the Riley Ridge Proposed Action, Alternatives, Environment, Environmental Consequences and Mitigation measures through efforts and research performed in the last year or two.

In assuming that a DEIS is to assess the environmental impacts possibly to occur due to continuing progression into a human oriented world, the statement serves to expose not only the proposed action and alternatives, but a summary of information collected from the technical reports enables all persons to grasp the effect of such a project in its entirety, and thus understand the consequences, known and unknown.

It appears as much public input as possible was sought to assist in the research of public concerns for the DEIS. Unfortunately, due to the time element involved for ground work, paper work and final actions, most of the public within a 100 mile radius of Riley Ridge have become unmotivated in their interest in the project. The DEIS is a valuable document pertaining to impacts evolving from industrial growth and should be of concern to those that will be directly affected.

My interest is sincere and the following are issues that should be furthur addressed in the final EIS.

2. SPECIFIC
Socioeconomics

A. Labor

17.1 The DEIS does not contain information necessary to analyse the regional labor potential for the project itself in all its phases. There needs to be data on qualifications required for each specific type of job that will possibly be available and how many people that job would possibly employ. Also a regional survey should be done to establish the numbers of unemployed and employed who are qualified for the specific jobs that will possibly be available.

17.1 (cont.) This data should apply to employment directly related to the project. There are many types of jobs that could be available and due to the fact that the area has already experienced the need for oil/gas related jobs, there is undoubtedly locally qualified individuals that could provide the necessary labor force for Riley Ridge.

As noted in previous projects depending on what state the contractor bases out of, the work performed within the State of Wyoming may only employ 10% (hypothetical) of a local qualified labor force. This does not help our local unemployed. Labor may come from out of state to work in Wyoming temporarily and leave when the work is done. These out os state workers contribute to the economy locally by spending some of their wages here, but a local resident worker would contribute a stabler, long term demand on services of various sorts addressed in the DEIS. This demand would create indirect employment opportunities.

In other words, Wyoming, specifically regionally, should have a healthy, qualified labor force from which the Riley Ridge project can draw from, especially those industrially orientd jobs. These people need to know of the specific opportunites and the info should be addressed in the final EIS.

I am not aware at this time if there is a requirement of the applicants to see that their contractors must choose employees from the local qualified potential workers, but it seems only right that these workers have first choice, then statewide workers could try for the jobs and last, but not least, out of state workers could hope for employment. Hope it is too, not just in other states but in Wyoming there are the potential workers waiting patiently for employment to best suit their qualifications. They would take a lesser job, just to be able to work locally.

A project such asRiley Ridge would offer enumerous employment opportunities and the local residents ought to have first chance at the benefits, because after all they will have to learn to live with the trade-offs.

B. Public and Human Services

Being the DEIS takes an in depth look at the environment in a worst case analysis, the benefits of Riley Ridge in the best case would hopefully be a strong, steady, stable and permenant growth in the area with an increase in revenues that could be used to improve the public and human services.

Towns closest to the project will desperatly need to upgrade their services. There are a few projects under way and it seems to be in preperation when a large labor force resides and works within the impacted area. The region is superb at this time for hunting and fishing recreation and the quality,as the game and fish proper, will be irretrievably impacted. There will be the change from a

natural human to animal interrelation form of recreation, to a man made recreation need. With the reduction of natural recreation quality the man made recreation enters the picture, which thus far has not been of high importance nor necessity in the region. The need for recreation parks with various facilities for sports and ARTS, is a high priority for the future.

Human services need to be brought to the areas attention of its importance, especially when people realize the full impact of a boom situation. The influx of people brings its share of problems and the more services available to administer to everyones needs the better for immediate and long term coping with the change in the environment and humans place in it.

C. Education

Education data is sufficient for the existing school system, and at least there is a base to work with. There will always be a need for upgrading education and the quality of educational standards needs to be constantly monitored.

Other forms of education for adults could be incorporated in public service facilities as well as outreach programs. Continuing education is an imperative part of human growth. To better ones knowledge is to open up more avenues for employment and self-production, a vital to humans as resources, regardless if one has to take a pipeline job to feed a family.

D. Social conditions

This area of socioeconomics ties into what I have discussed previously, because the area will change quickly and the transition will affect many social conditions. Improvement is the key. To effectively manage the rapid growth will require an interest in assuring that the area receives what it deserves to better the quality of life. Jobs for local people would offer background and experience to instill a sense of community, area and personal pride along with new growth.

SUMMARY

Riley Ridge, proposed action or alternatives will greatly affect the environment. Consequences large or small mean change, the only dependable constant. Riley Ridge short term impacts are associated with rapid growth, change and tough adjustment for the entire environment. I don't believe mankind can honestly feel a project of this sort is completely viable, nor that our existing technology is sufficient and advanced enough to control the consequences ever present within such a project. There is too much left to chance, a gamble to keep the United States warm. Riley Ridge is close to Americas heartland, Yellowstone Park, a sacred hold-out for hopes of truce with the game, fish, water, air, views. Riley Ridge is in my home territory and even though action hasn't begun yet, I feel it. We all feel a little bit of that hesitation, but it ends when we think of the money to be made.

I am impressed with the Riley Ridge DEIS and accompanying Tech reports. I am impressed with the amount of time and research that goes into such a project. I realize the worst is first. Only through mitigation measures will the impact be softened. Concerning mitigation, page 1-13 of the DEIS has some memorable words to say:

'Funding for the mitigation program is not the sole responsibility of the applicants but rather can come from a variety of sources including federal and state governments, city and county governments, as well as fees to residents and businesses expected to benefit from the proposed project. Responsibility for implementation of the plan lies with the applicants.'

This statement brings me to a conclusion. Is the applicants responsibility only to extract the minerals under lease from the ground? I feel their responsibility goes way beyond, into the communities, to the people, to the loss of critical habitat and animals, to themselves as part of the delicate environment we inhabit on this earth. Yes, we. We are all a part of this ongoing development of the earth, but the applicants role is proportionately the biggest, and if money is the reason for development of Riley Ridge, then the applicants should pay their proportionate share for all forms of development and necessities related to the Riley Ridge Natural Gas Project.

Thank-you.

Respectfully submitted,

Carmen D. Hakola

Carmen D. Hakola
P.O. Box 7
LaBarge, Wyoming 83123
307-386-2529 367-2768

I am a 6 year resident near LaBarge, active in hunting, fishing, hiking, photography, historic and cultural research, education. Professionally I work as a Real Estate Broker through-out the Green River Valley.

Response to Comment Letter 17

17.1 The assessment of the potential employment impacts of the Riley Ridge Project considered the current labor force including those employed in the oil and gas industry, the demand for labor by other known future projects, and the labor needs of the Riley Ridge Project to the extent that the companies can now specify them. The result of this analysis in terms of increased numbers of jobs by broad employment category appears in Table 4-2 on page 4-3 of the DEIS. In deriving these numbers, workers who were coming off completed projects for which the Riley Ridge Project has a need were assumed to work on the project. Hence, there was maximum considera tion of these projects. Public hearings and dissemination of the DEIS and final EIS assures the public's being informed of these potential employment opportunities well in advance of project initiation.

Comment Letter 18

United States Department of the Interior

NATIONAL PARK SERVICE
ROCKY MOUNTAIN REGIONAL OFFICE
655 Parfet Street
P.O. Box 25287
Denver, Colorado 80225

IN REPLY REFER TO:
L7619 (RMR-PC)

Mrs. Janis VanWyhe
Riley Ridge Project Leader
Bureau of Land Management
Division of Environmental Impact
Statement Services
555 Zang Street
First Floor, East
Denver, Colorado 80228

Dear Mrs. VanWyhe:

This is in response to the Bureau of Land Management's request for comments on the proposed Riley Ridge sour gas development project, Lincoln, Sublette, and Sweetwater Counties, Wyoming.

18.1 Table 3-22, page 3-36, lists existing sources in the study area. However, these sources were not addressed in the PSD increment analysis. The PSD increment analysis should not be limited to the proposed sources but should also include other increment consuming sources in the area.

18.2 Table 2-1, page 2-4, shows the PSD class I increments would be exceeded under three listed alternatives, if the maximum concentration is used. Footnote 2 points out that the short-term increments allow one exceedance per year. Footnote 2 further states, "This is important because it means the maximum value is compared to the increment or standard."

Although one exceedance is permitted, it has been EPA's policy to rely on the maximum concentration if the modeling analysis was based on only one year of off-site meteorological data. If five years of data were used, the highest second-high concentration would be compared to the increment.

18.3 Table 2-1 also shows that (1) the 24-hr, class II SO_2 increment will be violated under the proposed action, (2) the Wyoming State standard for H_2S will be violated under the proposed action and the three alternatives, and (3) the ambient impacts from emissions exceed an odor significance level under the proposed action and the three alternatives. Under the Clean Air Act, a new major stationary source can not be permitted to construct if the PSD class II increments will be exceeded. There are no provisions for exemptions of the class II increments. Thus, the proposed action will not be able to obtain a PSD permit. It appears similar provisions apply regarding the Wyoming H_2S standard. Therefore, neither the proposed action nor any of the three alternatives will be able to obtain a Wyoming state permit, due to the predicted H_2S violations.

18.4 Fontenelle Creek, from Fontenelle Reservoir to its source, has been included on the final list of the Nationwide Rivers Inventory. Rivers that have been included on the final list have been selected after consideration of the degree to which the river is free-flowing, the degree to which the river and corridor are undeveloped, and the outstanding natural and cultural characteristics of the river and its immediate environment. The Nationwide Rivers Inventory was completed for the purpose of identifying potential wild, scenic, and recreational rivers within the United States.

Map 4-3 clearly indicates that a significant portion of Fontenelle Creek will suffer adverse visual impacts due to pipeline and transmission line crossings. We are also concerned about the proposed sulfur drain shown on the bank of Fontenelle Creek on Map 4-3. The document does not clearly state anything about this drain - its purpose, appearance, or expected impacts. If it would be used to drain sulfur or other material from the proposed pipeline into Fontenelle Creek, we would have serious reservations about its impacts on the creek's water quality and therefore its future as a potential National Wild and Scenic River. We would like to see some clarification in the final environmental impact statement of the anticipated impacts on Fontenelle Creek from the proposed sulfur drain.

18.5 In any case, we recommend that alternatives to a crossing of Fontenelle Creek be explored. A re-routing of the pipeline and transmission lines to the east of Highway 189 in this area would avoid adverse impacts. However, if a routing across Fontenelle Creek is absolutely necessary, we suggest that only one crossing site be considered in order to minimize visual intrusion on the stream. We also recommend that an alternative site be considered for the proposed sulfur drain at this crossing.

18.6 While the document is quite clear in its description of anticipated impacts on local and regional recreation, it fails to discuss possible mitigation measures which might be useful in alleviating them. There is ample precedent for assistance from project sponsors to local governments when large population increases are expected. This is especially important in light of the acknowledgement on page 4-64 that the significant recreation impacts attributable to the Riley Ridge project will be further aggravated by interrelated projects in the region. We recommend that the final environmental impact statement contain a detailed list of measures being proposed by State and local officials, BLM, the Forest Service, and the project sponsors to mitigate the expected overrun of local recreation facilities by new residents.

The anticipated need for new recreation areas presents the Lake Mountain WSA as a possibility for an additional component in the local recreation network, should it not be designated as wilderness. As part of the aforementioned consultation with State and local officials, we recommend that this area be given consideration for development as a recreation facility, or for special designation by BLM in order to preserve its outstanding natural characteristics. The final environmental impact statement would benefit from a more thorough examination of potential adverse impacts on this WSA, such as the air quality violations and visual intrusions described in the Summary.

18.7

18.8 The document does not contain any discussion of mitigation measures for adverse effects on the trail resources listed on page 3-48 as being impacted

18.8 (cont.) by the proposed action and alternatives. The Oregon Trail has been designated as a National Historic Trail. The National Park Service should be consulted about any anticipated impacts. Please contact Mr. Reed Jarvis, National Park Service, Pacific Northwest Regional Office, 2001 Sixth Avenue, Seattle, Washington 98121.

18.9 The comparison of alternatives in the text makes constant references to specific sites and corridors, necessitating extensive use of the accompanying maps. Therefore, we recommend that a color format rather than black-and-white be used in the final environmental impact statement, and that the proposed action and each alternative be shown separately or on overlays.

We appreciate the opportunity to comment.

Sincerely,

Richard A. Strait
Associate Regional Director
Planning and Resource Preservation

Responses to Comment Letter 18

18.1 With the exception of the Whitney Canyon and Carter Creek gas processing plants, all the sources listed in Table 3-22 of the DEIS have been in operation for some time and their impacts can be represented by existing air quality measurements. Cumulative impacts from Whitney Canyon were addressed (see page 4-48 of the DEIS) and were found to be insignificant. Since emissions from Carter Creek are two orders of magnitude less than Whitney Canyon, cumulative impacts from this source are also assumed to be insignificant.

18.2 EPA's "Guideline on Air Quality Models" and "Regional Workshops on Air Quality Modeling" contain no documentation of the EPA policy referenced by the commenter. In addition, comments received from EPA do not indicate use of the highest second-highest value is inappropriate for determining the significance of impacts.

18.3 The commenter is correct in the assertion that all federal and state air quality standards must be achieved before any of the proposed operations can obtain a Wyoming State air quality permit. That evaluation will be made by the Wyoming Department of Environmental Quality at the time of review of a PSD permit application. Modeling for that permit will be based on the on-site data being collected by the applicants and may yield results either higher or lower than these contained in the DEIS. If the PSD permit review indicates compliance cannot be achieved under the proposed action or alternatives, the Wyoming Department of Environmental Quality will prescribe appropriate mitigation measures to ensure compliance prior to issuing the permit.

18.4 The operation of the sulfur drains is discussed on page 1-30 of the DEIS, and potential impacts from this operation are discussed on page 4-54. Impacts to Fontenelle Creek are not anticipated.

18.5 Thank you for your comment. This information will be considered in the final decision making process and location of the rights-of-way and sulfur pit. For engineering reasons and because of increased impacts on health and safety (potential H_2S exposure), visual resources, and recreation resources, it may not be practical to locate the crossings closer to Highway 189, Fontenelle Reservoir, and Fontenelle Recreation Area.

18.6 Appendix D of the DEIS discusses several mitigation measures which could be effective in reducing adverse impacts to recreation. While these cannot be required as formal committed mitigation measures, mitigation measures for recreation would also be considered as part of the Wyoming Industrial Siting Administration permitting process.

18.7 Air quality standards (PSD Class II) would not be exceeded in the Lake Mountain WSA. Since the WSA is west of the proposed gas treatment plants, prevailing winds would carry emissions away from the WSA. The wind roses shown on pages 3-32 and 3-33 of the DEIS indicate that winds from the east occur a very small percentage of the time. As discussed on page 4-65 of the DEIS, two wells are proposed within the WSA. The wells and their associated access roads and gathering pipelines would cause a visual intrusion on the eastern side of the WSA. The BLM will not allow any activities that would impair the wilderness suitability of the WSA until Congress has completed its review of the area.

18.8 The development of a formal compliance plan for mitigation of potential impacts to cultural resources was discussed on pages 4-61 and 4-62 of the DEIS. The National Park Service will be contacted, as appropriate, regarding any potential impacts to a National Historical Trail. Thank you for your comment and information.

18.9 The lead agencies (BLM and FS) decided against the use of color graphics in the DEIS because of the substantial cost involved. The maps from the DEIS will not be reprinted or revised for the final EIS.

OREGON-CALIFORNIA TRAILS ASSOCIATION

Board Of Directors
James F. Bowers (1985)
150 South Otis St.
Lakewood, CO 80226
(303) 922-0535
E. G. Chuinard, M.D. (1984)
15557 Southwest Summerfield Lane
Tigard, OR 97223
(503) 620-7744
Troy Gray (1984)
3947 Park Lane
Dallas, TX 75220
(214) 350-0176
Thomas H. Hunt (1983)
950 Old Trace Road
Palo Alto, CA 94306
(415) 941-0815
James P. Johnson (1983)
P.O. Box 608
Fort Collins, CO 80522
(303) 482-5058
Stanley B. Kimball (1985)
745 Saddle Drive
Florissant, MO 63033
(314) 831-7873
John A. Latschar (1985)
794 Urban Street
Golden, CO 80401
(303) 234-6103
Charles W. Martin (1985)
311 North 61st Street
Omaha, NE 68132
(402) 556-4488
Merrill J. Mattes (1984)
5800 W. Plymouth Avenue
Littleton, CO 80123
(303) 979-6007
Bertha L. Rennells (1983)
Box 746
La Grande, OR 97850
(503) 963-5820
Robert D. Tucker (1984)
10380 Glenmon Drive
Lakewood, CO 80226
(303) 985-9331
Merle W. Wells (1983)
1325 Longmont
Boise, ID 83706
(208) 342-3135
Gregory M. Franzwa (1983)
Chairman
Box 42
Gerald, MO 63037
(314) 764-2801

Honorary Board Member
Russell E. Dickinson, Director
National Park Service
Washington, D.C.

Officers
President:
Gregory M. Franzwa
Executive Vice President:
Merrill J. Mattes
1st Vice President:
Robert Rennells
Box 746
La Grande, OR 97850
(503) 963-5820
2nd Vice President:
Mrs. Billie Gray
3947 Park Lane
Dallas, TX 75220
(214) 350-0176
Secretary:
John A. Latschar
Assistant Secretary:
Robert D. Tucker
Treasurer:
James F. Bowers

Legal Counsel
James P. Johnson

July 14, 1983

Ms. Janis Vanwyhe, Project Leader
Bureau of Land Management
Division of EIS Services
555 Zang Street - 1st Floor East
Denver, CO 80228

Dear Ms. VanWyhe:

This is our formal response to the Riley Ridge Environmental Impact Statement. The Oregon-California Trails Association is totally opposed to that portion of the Riley Ridge project which would bring a molton sulfur pipeline and ancillary facilities down the west bank of the Green River south of LaBarge.

19.1 We feel, however, that this routing would not have been suggested had the planners been aware that the main stem of the Sublette Cutoff is exactly in the path of this pipeline for several miles, instead of where the maps in the EIS show it to be. Those maps are in error.

If you will be so kind as to provide me with a set of USGS 7½' quads we will be pleased to trace the correct routing on them and return them to you.

We realize that it may be necessary to cross the Sublette and Slate Creek Cutoffs one or more times by various facets of this project. When that is done, we respectfully request that such crossings be at more or less right angles, with the least possible disturbance of the historic trails. We hope you will insist that access to the facilities by heavy equipment will be over roads and trails not associated with the Sublette Cutoff or the Slate Creek, Dempsey or Kenney trails.

Thank you for inviting OCTA to participate in this process. In the future, please send reports to the following:

Gregory M. Franzwa Box 42 Gerald, MO 63037	Mr. & Mrs. Chester Buck Box 147 La Barge, WY 83123	Mr. & Mrs. Troy Gray 3947 Park Lane Dallas, TX 75220
	Mr. Reg P. Duffin 822 Beach La Grange Park, IL 60525	

Respectfully submitted,

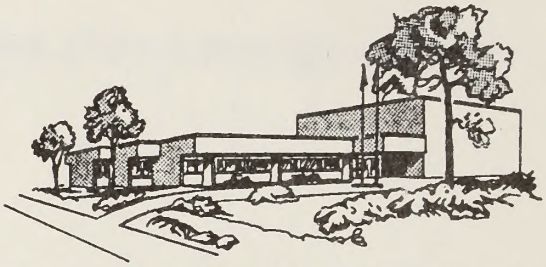
Gregory M. Franzwa
President

Responses to Comment Letter 19

19.1 See Responses to Comments 1.1 and 1.2

Comment Letter 20

DEPARTMENT OF PUBLIC WORKS
HOUSING (307) 362-3138
ENGINEERING (307) 362-7547
PLANNING (307) 362-7542
INSPECTION (307) 362-7544
COMMUNITY DEVELOPMENT (307) 362-6892



CITY OF ROCK SPRINGS
212 D STREET/P.O. BOX 698/ROCK SPRINGS, WYOMING 82901

July 15, 1983

Mrs. Janis VanWyhe
Riley Ridge Project Leader
Bureau of Land Management
Division of Environmental Impact Statement Services
555 Zang Street
First Floor, East
Denver, CO 80228

Dear Mrs. VanWyhe:

On July 17, 1983, the Rock Springs Planning and Zoning Commission discussed the Riley Ridge Natural Gas Project. Although the overall project would be beneficial to Southwest Wyoming and should be encouraged, the Commission is concerned about the CO_2 and sales gas pipeline which could adversely affect the City of Rock Springs. It is proposed for location at the base of White Mountain just west of Rock Springs.

The route, as proposed, would run through existing residential development northwest of Rock Springs and proposed residential development in west Rock Springs. Several utility easements and rights-of-way already exist in west Rock Springs and have created considerable problems for development. Any other utility easement will only compound the problem.

20.1 Because west Rock Springs is developing rapidly and will receive most of Rock Springs' development pressure in the near future, the Rock Springs Planning and Zoning Commission is opposed to the proposed route and recommends that the pipeline be re-routed away from White Mountain and west Rock Springs.

On behalf of the Rock Springs Planning and Zoning Commission, I thank you for the opportunity to comment on the Riley Ridge Project.

Sincerely,

Alan May

Alan May, Vice-Chairman
Rock Springs Planning and Zoning Commission

AM/ph

cc: Rock Springs City Council

Response to Comment Letter 20

20.1 See Response to Comment 10.1

Comment Letter 21

NORTHWEST PIPELINE CORPORATION

P.O. BOX 1526
SALT LAKE CITY, UTAH 84110-1526
801 583-8800

July 18, 1983

Ms. Janis VanWyhe
Bureau of Land Management
Division of EIS Services
555 Zang Street, First Floor East
Denver, CO 80228

Dear Ms. VanWyhe:

The draft environmental impact statement for the Riley Ridge Natural Gas Project has been reviewed by Northwest Pipeline Corporation (Northwest). We consider this document to be a well presented and exemplary treatment of a complex project. The U.S. Bureau of Land Management, U.S. Forest Service and Environmental Research and Technology, Inc. are to be commended for their efforts and expertise in preparing this document. Northwest appreciates the opportunity to express our comments and respectfully submits the following general and specific comments.

GENERAL COMMENTS

21.1 It should be made clear that not all mitigation measures apply to all of the companies in all cases. Many of them appear to be all encompassing. It has been our experience that mitigation measures can only be discussed in detail after the project design is completed and prior to the granting of right-of-way. It is at this point that the applicant and the agencies can best resolve how to mitigate a problem by selecting a course of action from the many choices available.

21.2 The "Applicants Standard Operating Procedures" as it appears in Appendix B-1 must be viewed as preliminary and subject to change as information increases and as plans and designs are refined. Each company's project has its own needs and its own set of variables. It is unfair to the general public to have them believe that every point of the SOP will be implemented

A SUBSIDIARY OF NORTHWEST ENERGY COMPANY
295 CHIPETA WAY, SALT LAKE CITY, UTAH 84108

21.2 (cont.) exactly as written. It must be made clear the Construction Use (CU) Plan and its constituent plans, e.g. the Reclamation Plan and Clearing Plan, etc., will contain the specific information.

21.3 To avoid confusion the introductory paragraph on page B-2 should be rewritten to reflect the above information or Appendix B-1 should be deleted.

SPECIFIC COMMENTS

21.4 Page vii, paragraph 2, sentence 1. This sentence states that methane production is 576 cfd, it should be 576 MMcfd.

21.5 Page viii, Health and Safety, Sentence 2. Does "extremely toxic" relate to 100% H_2S or the 4% H_2S Riley Ridge gas? If the reference pertains to 4% H_2S, this description is misleading.

21.6 Sentence 4 of paragraph 8, page vii contains the term "acid rain." The term acid deposition is technically correct and is also used elsewhere in the document. We therefore recommend substituting the word deposition for rain.

21.7 Page x, paragraph 1, sentence 1. This section on socioeconomics states that the proposed action would have significant adverse impacts on housing and local public services. It would be more correct to state that without mitigation there will be significant impacts, adverse is judgemental and not founded. Mitigation measures have actually been in place in Lincoln County for several years, since the creation of the Overthrust Industrial Association.

21.8 Page x, paragraph 4, sentence 1. This sentence in the air quality summary suggests that Exxon and Northwest have a problem to resolve based on the results of off-site meteorological data. The meaning of this is not clear and therefore misleading. This statement insinuates that there is a problem with results. This is incorrect as there are no problems with results. The only issue to be resolved is verification of the EIS findings that no air quality standards will be violated. This verification will come from modeling with on-site meteorological data for PSD permitting requirements.

21.9 Page x, paragraph 10, sentence 1. It is stated in this sentence that the agencies will allow the applicants to vent carbon dioxide until an economic market is identified by the BLM and MMS. It is not our understanding that the BLM or MMS have the authority or responsibility to identify economic markets for private industry. No one in this project wants a market for CO_2 more than the applicants who have been actively engaged in developing one. If the agencies are going to identify this market for the companies, please explain how, when and by what authority and parameters for qualifying it "economic".

21.10 The following sentence states that when a market has been identified the CO_2 must be sold or compensatory royalty will be assessed for the marketable volume. There is at present no royalty on CO_2. Regardless of whether or not there will be a royalty, we question the relevancy of this topic in an EIS. We do not see where the authors have tied the subject of marketability of CO_2 and royalties to the environmental impact of the project. Unless this is done we request these two sentences be deleted.

21.11 On page 1-1, paragraph 8, sentence 1, it is stated that 1.876 cubic feet/day of CO_2 will be vented. Please change this to 1.876 billion cubic feet/day.

21.12 This paragraph also discusses marketing and royalties in reference to the CO_2 content of the gas. As stated above this is an economic concern faced by the companies proposing gas processing facilities and has not been tied into environmental impact. As above we request this topic be deleted.

21.13 Page 1-3, paragraph 1, sentence 5. The use of CO_2 as a transporting medium in coal slurry pipelines is theoretically possible, and has been proposed, but is not proven and much too exotic to be listed as an example. There are other, more realistic uses that could be given.

21.14 Map 1-1 on page 1-4 has a dot indicating the location of Calpet which is composed of five houses. This dot is larger than those representing the towns of Pinedale, Big Piney, and Kemmerer. This gives the reader a false impression of the size of Calpet.

21.15 Table 1-5 on page 1-17 contains several errors regarding Northwest's by-products and plant facilities. Northwest's by-product sulfur production will be 676 TPD, not 757. We are proposing a water pipeline from the Green River to the plant site, not water wells. Our sales gas will go into our own pipeline not that of, Trailblazer Pipeline also identified on Page 1-49, Paragraph 1.

21.16 On page 1-24, paragraph 4, sentence 1 states that released hydrostatic test water will be filtered. This procedure is not normally required by Wyoming DEQ and is seldom necessary.

21.17 Page 1-28, paragraph 11, sentence 1. Neither Northwest nor any of the other applicants would construct the powerlines. This would be done by Utah Power and Light Company.

21.18 Figure 1-9 Page 1-31 does not represent a typical well site as proposed by Northwest, and should not be represented as such.

21.19 Figure 1-15 on page 1-42 does not list Northwest's Craven Creek Camp in the Employee Housing section of the component alternatives. This camp will be used for the Proposed Action, Buckhorn, and Shute Creek Alternatives. Northwest will have a camp in East Dry Basin for the Northern Alternatives.

21.20 Page 1-34, paragraph 4 presents a discussion of Northwest's gas treatment process. However this discussion omits any reference of Northwest's proposal for a tail gas clean up process which minimizes SO_2 emissions to the atmosphere. Currently, Northwest is proposing the use of Amoco's CBA (Cold Bed Absorption) process. This process has been chosen for its proven reliability in conjunction with relatively low operation and maintenance costs as well as energy (fuel) savings over many other available processes. The CBA process has been approved as Best Available Control Technology for similar plants including facilities in Wyoming. Northwest believes that the authors

21.20 (cont.) of the EIS have placed too much emphasis on other control technologies (i.e. SCOT) proposed by other company participants, therefore unfairly biasing the public toward a name brand process. Early in the plant site selection process, Northwest performed numerous screening studies which indicated that all air quality standards would be met with the proposed process.

21.21 On page 1-53, under the heading Sour Gas Treatment, it is stated that Exxon rejected Amoco's CBA tail gas process because it could only achieve a 98.6% recovery efficiency. This is not correct. Because of complex terrain at the East Dry Basin location a 98.6% recovery efficiency is not enough to prevent exceedence of certain ground level concentration standards. However, Amoco's CBA process with a 98.6% recovery efficiency is sufficient for the Buckhorn, Craven Creek, and Shute Creek sites all of which have more open terrain.

21.22 Table 1-20 on page 1-57 shows Mobil as having well field drilling and operation employment in 1983. This is in error as Mobil will not be doing field work on this project in 1983.

21.23 Table 3-31 on page 3-60 lists Northwest's market area as being the West Coast/Gulf States. This is incorrect. Northwest's market area is the Pacific Northwest.

21.24 Figure 1-12 page 1-37 is misleading. The plant description should include processes performed, treatment, and gas composition.

21.25 Page 4-33, paragraph 5, sentence 3. This sentence makes the statement that a person would receive a lethal dose of H_2S within one-half mile of a well blowout and would receive a dose causing discomfort within 1 to 2 miles. We object to the use of the word would in both cases. Too many external factors are involved to be so positive as to assume "would". We request the substitution of "could" for "would".

21.26 Page 4-53, paragraph 8, sentence 4. The 80% figure for roads remaining in use following abandonment appears to be used without justification. Whether or not a road remains in use is left to the discretion of the local land manager and his staff. It has been our understanding that both the FS and BLM are desirous of eliminating as many of these roads as possible. A large portion of the roads will be single user roads which makes abandonment relatively simple. We suggest the 80% figure to be high and could be reduced by half or that a number range be used.

21.27 Page 4-61, paragraph 8, sentence 4. This statement is incorrect. Northwest has released to the BLM, Kemmerer Area Office, the cultural resource report for the plant site. However, because this report only covers the proposed plant site and not the attendant pipeline and railroad corridors, Northwest believes the cultural resource report to be incomplete and lacking in overall total project analyses to be used in developing an adequate mitigation program.

21.28 On page 4-133, mitigation measures WF-11 requires that major crossings of the Green River by pipelines be placed at islands. This is environmentally

21.28 (cont.) unsound and highly objectionable to Northwest. The preferred situation for a river crossing is at low flow as suggested, at a narrow portion of the river, and where the river is straight with parallel banks. To cross at an island will cause the disturbance of a larger area of riparian habitat. It will also cause heavy construction equipment to be in the river a longer period of time thereby adding more sediment to the water. Depending on any additional requirements for an island crossing, environmental damages could be more serious.

Northwest has crossed the Green River in this area four times and has also constructed pipeline crossings on the Colorado River in Utah, the Snake River in Idaho, and the Columbia River along the Washington-Oregon border as well as numerous smaller rivers throughout the West and Northwest. We have considerable experience with river crossings both in Northwest Pipeline Corporation and in our sister subsidiary Northwest Alaska Pipeline Corp. We strongly recommend that this mitigation measure be reconsidered. We would be more than willing to work with the agencies on this.

21.29 Page B-26, paragraph 2, sentence 5. This sentence states "The Erosion Control Revegetation, and Restoration Guidelines and CU Plan will be implemented under the direction of the appropriate agency official". This would be more correct if written. "The CU Plan will be approved by the Authorized Officer and implemented by the companies."

21.30 Sentence 1 of paragraph 5, page B-26 uses the word measures when referring to the erosion control and restoration guidelines. We suggest substituting "guidelines" for "measures" to be consistent with the appendix title.

21.31 A list of subjects follows paragraph 5 of page B-26 in which the term biochemicals is used. We suggest changing Biochemicals to Chemicals. Biochemical is an adjective not a noun and biochemicals as a jargon term is virtually meaningless.

21.32 The fourth item under Right of Way and Site Clearing on page B-26 states that slash will be piled for later shredding and chipping for use in restoration operations. Chipping and shredding is not advantageous over properly "walked-in slash". We suggest this guideline read, "slash will be windrowed and later used in restoration ...." Windrowing minimizes double handling of slash.

21.33 On page B-27, under the heading Site Preparation, Trenching, etc., the first item discusses only double ditching as a topsoil removal method. There are other techniques, the choice of which rightfully belong to the individual company.

21.34 Under the heading backfilling and grading on page B-27, the fifth item requires restoration be done to dirt structures "so that they will function as originally intended." We believe this phrase should be deleted. The original intent may have little to do with preconstruction conditions.

21.35 The seventh item, under Backfilling and Grading on page B-27, discusses the return of topsoil over trench fill and other disturbed areas and the restoration of productivity to preconstruction conditions. We will definitely return topsoil to all disturbed areas but the matter of restoring productivity

21.35 (cont.) to preconstruction conditions cannot be dealt with so lightly. Restoration of productivity should be addressed elsewhere as a separate subject.

21.36 The third item under land preparation etc. on page B-28, discuss mulching. We believe this item should be deleted. Total mulching is not necessary (though often beneficial, it is not the current practice in this area).

21.37 The fifth item under land preparation deals with the application of commercial fertilizers. Where required by landowners we will apply fertilizers to cultivated areas disturbed by construction in order to maintain crop yield. However, the use of starter fertilizer on non-irrigated grasses in semi-arid regions is usually of little or no benefit, and may actually be damaging, and we recommend the requirement to do so be deleted from the guidelines.

21.38 The eighth item under Land Preparation etc., requires that cultivation and land preparation on steep slopes be done on the contour. This is unsafe. Equipment operating along the contours of steep slopes produces hazardous working conditions. In addition, the narrow width of the Right of Way renders such an operation impractical.

21.39 Under the heading Revegetation on page B-28, the second sentence of the first paragraph states that revegetation methods and procedures will follow the recommendations and directions of local experts. The judgement and

21.39 (cont.) opinions of local experts should always be considered, however, professional opinions often differ. For this reason we recommend substituting "consider", for follow so not to be limited to one person's ideas.

21.40 The first item under Revegetation on page B-28 requires mulch and a cover crop for the seed bed. It is our contention that total mulching and cover crops are not warranted. We request that this requirement for mulch and cover crops be deleted.

21.41 The third item under Revegetation specifies a 100% increase over whatever the regular seeding rate happens to be. Seeding rates will be discussed in our reclamation plan which will be prepared for the Authorizing Officer's approval. This document will be submitted prior to the granting of right of way and the commencement of construction. It is in the reclamation plan and with the Authorizing Officer that the details of seeding rates should be discussed, not here.

21.42 On page B-29, the heading "Use of Biochemicals" should be changed to "Use of Chemicals." The word biochemicals as a noun, is virtually meaningless.

21.43 Under the heading Stream Protection on page B-29, the first paragraph contains the phrase "flood plain effectiveness." This term should be defined or deleted.

21.44 The second item under Stream Protection states that clean water diversion methods will be used whenever construction activities pass through a stream

21.44 (cont.) channel. Such diversion methods are not always beneficial, necessary, or required. It would be more correct to state that they would be employed "where necessary and practicable."

If you have any questions concerning our comments please let me know. Thank you for the opportunity to comment on this document.

Sincerely,

NORTHWEST PIPELINE CORPORATION

W.J. Huhtala
Manager
Environmental Affairs

ps

Responses to Comment Letter 21

21.1 Mitigation measures are presented by resource, not by company. As stated on page 4-131 of the DEIS, you are correct, the required, measure will be included in the right-of-way grants.

21.2 It is understood that the applicants will need to modify their plans and designs as detailed engineering is conducted and that specific information will be contained in the Construction and Use Plan. The Standard Operating Procedures were included in the DEIS in Appendix B to provide the decision maker with information on the procedures the applicants typically apply during construction and operation that tend to reduce impacts.

21.3 A clarifying statement has been added. See the Errata Summary for the revised text on page B-2 of the DEIS.

21.4 The revision has been made. See the Summary (Section 1) of the FEIS.

21.5 Hydrogen sulfide (H_2S) is an extremely toxic gas. All health and safety analyses were based on the concentrations of H_2S that could occur in the air (e.g., 1,000 parts/million) in the event of a sour gas release. The percentage of H_2S in the sour gas, the volume of gas released, and meteorological conditions at the time of the release would determine the concentration of H_2S in the air and potential health and safety hazards.

21.6 The revision has been made. See the Summary (Section 1) of the FEIS.

21.7 The assessment of impacts considered those mitigation measures which were part of the company project descriptions. Even given these, significant impacts can be expected to occur. Whatever mitigation measures have already been implemented by or through the Overthrust Industrial Association are already accounted for in the description of the baseline.

21.8 The EIS has been modifed to clarify this point. Also refer to the Response to Comment 18.3. See revised Summary, Section 1 in the FEIS.

The Exxon and Northwest plants will undergo similar review as part of the PSD permitting process. On-site meteorological data would be used by the Wyoming Department of Environmental Quality to verify the results found in the DEIS (e.g., no significant impact). If the on-site showed problems of compliance with PSD increments or air quality standards, that issue would have to be resolved by installation of additional plant emission controls or other appropriate modifications.

21.9 and 21.10 The BLM will not identify economic markets for private industry, but rather has the jurisdiction and responsibility to insure that gas resources are not wasted and, in conjunction with MMS, that the proper royalties are collected. Therefore, as part of BLM's responsibilities toward conservation and prevention of waste of federal natural resources, a necessary determination of CO_2 marketability will be made which could affect royalty collection.

21.11 Revision made. See Errata Summary for page 1-1 of the DEIS.

21.12 The question of CO_2 venting and royalty collection is addressed in the EIS since allowing the venting of CO_2 may represent a loss of royalty to the U.S. government, of which a portion is returned to state and local governments. This potential royalty loss could be an indirect economic impact to the Riley Ridge Project area. The venting of CO_2 would also result in the loss of the gas resource.

21.13 Please see Errata Summary for page 1-3 of the DEIS for a clarification of this statement.

21.14 Your observation is correct. The dot representing Calpet should have been the same size as those representing Pinedale, Big Piney, and Kemmerer. The intent was to identify locations only and not community sizes.

21.15 Northwest's sulfur production would be 757 TPD or 676 *long* TPD. All production numbers were converted to TPD for consistency.

See Errata Summary for revisions to Table 1-5 for page 1-17 of the DEIS.

On page 1-49 the DEIS states that it was assumed that Northwest's CO_2 pipeline would parallel Exxon's to Trailblazer and that Northwest's sales gas pipeline would be located in corridors utilized by other applicants.

21.16 The statement intended to indicate that filtering would be conducted only if required by the Wyoming Department of Environmental Quality. Your clarification is appreciated.

21.17 This statement has been corrected on the Errata Summary for page 1-28 of the DEIS.

21.18 It is understood that each applicant will have different layouts for their well pads both during drilling and operation. The illustrations have been provided to give the reader a general idea of the facilities that would be present and their locations. The illustrations are not intended to represent the well sites of any specific applicant.

21.19 Northwest is the only applicant that has included a construction camp as part of its proposed action and alternatives. Therefore, Northwest's camp is not a component alternative and should not be included in this figure.

21.20 Thank you for the additional information. It is not the intention of the DEIS to emphasize or endorse one control technology over another. The Wyoming Department of Environmental Quality would review proposed control technologies as part of the PSD permitting process; this is not the role of the BLM or FS during the EIS process.

21.21 Please refer to response 21.20 and the Errata Summary for page 1-53 in the DEIS. The text has been modified to more accurately reflect Exxon's rationale for rejecting the Amoco CBA process for its West Dry Basin plant site.

21.22 Table 1-20 on page 1-57 of the DEIS has been corrected in response to your comment. See the Errata Summary.

21.23 Revision made. See Errata Summary for page 3-60 in the DEIS.

21.24 Figure 1-12 on page 1-37 in the DEIS was included to give the reader an idea of the visual appearance of a gas treatment plant. It is not deemed necessary for reader understanding to explain the technical differences between the plant in the photograph and the proposed Riley Ridge plants.

21.25 In order to be consistent with the language on page 4-33 of the DEIS, *would* has been changed to *could*. See Errata Summary.

21.26 The 80 percent figure was chosen to be a worst-case estimate of the amount of roadway that could remain in service following abandonment. If one refers to Table 1-9 on page 1-24 of the DEIS, it can be seen that approximately 40 percent of the well field access roadway system is made up of existing two-lane and lane-and-a-half roads. Most of these roads, as well as some upgraded primitive roads and new roads, would remain in service following project abandonment. The decision on which roads would remain in use would be made by the FS, BLM, and Sublette County Road Commission. If a larger percentage of the access roads is reclaimed, impacts from the project at abandonment would be smaller.

21.27 At the time the DEIS was written, the statement was correct. Northwest subsequently released the report to the BLM Kemmerer area office. The BLM agrees that the report covers only a limited portion of the land that would be disturbed by Northwest's proposed development.

21.28 The text has been changed to eliminate the requirement. See Errata Summary for page 4-133 of the DEIS.

21.29 See Errata Summary for page B-26 of the DEIS for revision.

21.30 See Errata Summary for page B-26 of the DEIS for revision.

21.31 Please see Errata Summary for page B-26 of the DEIS for revisions.

21.32 In most cases this is true. The Construction and Use Plan and the right-of-way grants will give details on the exact methods to be used. See Errata Summary for page B-26 of the DEIS.

21.33 Yes. The requirement is to save the topsoil and there are several methods which can be used. See Errata Summary for page B-27 of the DEIS.

21.34 The objective is to have them function as well as preconstruction conditions. Please see Errata Summary for page B-27 of the DEIS for a clarification of this objective.

21.35 Restoration of productivity will be addressed in the Construction and Use Plan.

21.36 Mulching is necessary in many areas and is a common practice. The text is correct as written, however, this does not mean it will be required in all cases. The right-of-way grants and Construction and Use Plan will be specific.

21.37 Fertilizers, like mulching, may or may not be required. See Response to Comment 21.36.

21.38 There are some hazards when working on steep slopes, however, there are methods that can safely be used to minimize erosion which is the purpose of the requirement. Also there are other, much larger areas that will be disturbed and reclaimed.

21.39 The authorizing agency or officer will make the recommendations, but as you say, the local experts should always be considered. Please see Errata Summary for page B-28 of the DEIS for clarification.

21.40 See Response to Comment 21.36.

21.41 In critical areas, where reseeding efforts are required (two or more seeding attempts), an increase of 100 percent is common practice and, as stated, rates will be discussed in the reclamation plan. The text is appropriate as is.

21.42 Revision has been made in response to your comment. Please see Errata Summary for page B-29 of the DEIS.

21.43 See Errata Summary for page B-29 of the DEIS for revision.

21.44 Clear water diversion methods are considered necessary for stream protection. It is assumed that nothing would be required that is not necessary. The text is appropriate as written.

Defenders OF WILDLIFE

July 16, 1983

Ms. Janis VanWyhe
Bureau of Land Management
Division of EIS Services
555 Zang Street, First Floor East
Denver, Colorado 80228

Dear Ms. VanWyhe:

Defenders of Wildlife has reviewed the draft environmental impact statement (DEIS) entitled "Riley Ridge Natural Gas Project," and offer the following comments in the interest of the wildlife resources.

Impacts from proposed projects described in the DEIS will affect a huge portion of Western Wyoming for a half-century or more. The purpose of the DEIS is to identify, examine, and to provide mitigating measures to blunt immense and complex impacts from these projects.

22.1 However, the DEIS fails to identify other mineral related impacts that are now occurring or that are planned to occur in Western Wyoming. These, when combined with the identified impacts will affect our air quality, our water, our wildlife and livestock, and our land to a much greater degree than the Riley Ridge projects by themselves.

Cumulative impacts must be identified. If you mitigate for a herd of elk on the East side of the mountain but ignore impacts from a different source that is affecting elk on the West side of the mountain, then the picture is only half-drawn.

Mitigation, in relation to minerals exploration and development, means that something is destined to go down the tube, but maybe not as much, or as rapidly, if there had been no mitigation. Unless total impacts, which are cumulative impacts, are assessed, then how can one determine how much to mitigate for what, or determine if we are mitigating entire ecosystems out of existence, or where to draw a line and refuse development because costs to our ecosystem outweigh the benefits from whatever might be extracted from the land?

For decades, exploration has gouged, drilled, and mutilated portions of Wyoming's plains and mountains to ascertain the contents of it's treasury and to harvest it's wealth. Now that the surface has been well scratched we know that Wyoming is blessed with a multitude of minerals and fossil fuels that, when totaled, may exceed the non-renewable resources of any other state. Many of these resources, other than oil and natural gas, occur in or around areas discussed in this DEIS.

Wyoming was twice blessed. Outdoor recreation and tourism is Wyoming's second largest industry. The heartbeat of this industry is Wyoming's wildlife. The land in Western Wyoming provides habitat for the largest herds of elk in our nation, for the largest herds of* pronghorn antelope, for the largest wintering concentration of Shiras moose in North America. Western Wyoming hosts one of the largest nesting and wintering populations of golden eagles and researchers are now learning that Southwest Wyoming may contain the largest nesting population of prairie falcons, anywhere.

1244 NINETEENTH STREET, NW • WASHINGTON, DC 20036 • (202) 659-9510

*, insert: "migratory"

The only black footed ferrets that we know of live in Western Wyoming, as do the most sage grouse. The largest concentration of big horn sheep in our country live in the Dubois area. A large portion of all the grizzly bears that exist south of the Canadian border roam the Greater Yellowstone ecosystem. Many streams, rivers, and lakes in Western Wyoming are blue-ribbon trout fisheries and support large numbers of waterfowl and other birds.

These huge populations of wildlife occur because immense, relitively intact ecosystems yet exist in Western Wyoming. If we allow these ecosystems to become fragmented, these populations of wildlife will plummet.

Much of Western Wyoming's wildlife is being adversely affected by energy and mineral related development. Some species are affected only a little. Others are beginning to take a beating. Contrary to what some would have us believe, most species of wildlife do not adapt to substantial changes in their environment. Some species are displaced by even subtle changes. When wildlife is displaced it does not move to somewhere else and live happily ever-after. All the other places are already occupied and available forage is already being utilized, so displaced wildlife generally ceases to exist.

22.2 Mitigation, as proposed in this DEIS, is in most instances woefully inadequate. Specifically:

Air Quality: The people of Wyoming, after observing how other states have allowed their air to become polluted, their buildings to be eaten away by emissions from burning coal, their lakes to be sterilized by acid rain, prevailed on their representatives to enact stringent, responsible, air quality standards.

Wyoming Ambient Air Quality Standards (WAAQS) may seem restrictive to some industries who still live in the era of pollution as usual. However, it is well documented that degradation of air quality for the sake of short-term profit actually costs people and governments much more in long-term problems than any benefits derived from the polluting industry.

Technology exists to remove almost all of sulphur dioxide emissions from the sweetening plants. All facilities must be required to provide the very best pollution control technology available. Under no circumstances should companies be allowed to violate Wyoming's air quality standards.

Hydrogen sulfide has killed both people and wildlife in Southwest Wyoming. Both sulphur dioxide and hydrogen sulfide emissions can create acid rain. Downwind from the Riley Ridge projects are wilderness areas and mountain ranges that contain hundreds of pristine lakes and streams that are poorly buffered to withstand devestation caused by acid rain.

22.2 (cont.) It appears that Exxon's facilities and Northwest's facilities will not exceed WAAQS pertaining to hydrogen sulfide. But hydrogen sulfide emissions from American Quasar's plant will exceed "significant levels" by more than three times. American Quasar must be required to go back to the drawing board and design a facility that will conform to WAAQS.

Helium: The Agency Preferred Alternative states that "...helium will be allowed to be vented..." About 13 billion cubic feet (bcf) of helium is lost to the atmosphere annually in our country. Helium is a valuable, non-renewable resource used in such technologies as superconducting transmission of power, magnetic

more

storage devices, and fusion. Last year about 300 million dollars was spent for helium research. A General Accounting Office report states that if sufficient quantities of helium are to be stockpiled for future needs, conservation policies must be enacted.

Helium reservoirs exist only in the atmosphere and in natural-gas fields. Producing helium from natural gas is relitively inexpensive (around 13 dollars per 1000 cubic feet), but recoverning helium from the atmosphere could cost as much as 2000 dollars per 1000 cubic feet.

22.3 Waste of helium is not unlike the decades when billions of cubic feet of natural gas was flared, wasted, and lost forever. In this age when we have finally learned a little about conserving our non-renewable resources, is venting helium a wise decision? In the final EIS, a discussion of helium resources by Bureau of Mines and other experts would be helpful.

Water Quality: Past land abuses from mineral and energy related exploration (and from other causes) are both legion and well documented. One only needs to make a short flight over the Dry Piney oil patch to view the rape of our land by those who didn't know or didn't care.

One might believe, now that we create environmental impact statements that regulate and cite federal and state laws to prohibit these abuses, that environmental rivers would run smoothly. Not true.

In Whitney Canyon, only three years back, Amoco and Chevron managed to combine their talents for irresponsibility and dozed a drill pad out into Painter Reservoir, an important wildlife and livestock water source and one of the few in the area.

Gross negligence killed the aquatic community in a portion of Fogarty Creek (in the DEIS area). Massive siltation from too many, poorly designed, poorly routed oil-patch roads was killing the creek. A poorly designed and maintained mud pit collapsed and provided the coup detat by filling the creek with chemical laden drilling mud. A portion of Pine Grove Creek suffered the same fate.

I used to catch beautiful Colorado Cutthroat trout from beaver ponds in Fogarty Creek. Today, beavers cannot even set up housekeeping because their dams keep silting in as fast as they build them.

The question; why were responsible parties not held libel and made to repair the damage. And if this kind of incident occurs again, which is likely, do we just write off another creek and try to forget, or will companies, like the rest of us, be held responsible for their actions?

22.4 Given the scope of proposed projects, siltation of fisheries, livestock water, irrigation ditches, and riparian habitat is a real threat. Roads should be held to a bare minimum, properly designed, carefully routed, and shared by the various companies where possible. The old oil-patch modus operandi of every man for himself and a few roads for every man is gone forever.

Siltation, when it occurs from pipeline crossings, roads, drill pads, should be contained by gabions or other structures until the distured area can be repaired or can be healed with vegetation.

Land Quality: About 13,000 acres will be disturbed by proposed actions, but indirect disturbance to wildlife will amount to many times that acreage. The proposed, more than 300 miles of roads, seems to be excessive. Coordination between Forest Service, Bureau of Land Management, and companies involved should

more

be able to pare this mileage considerably. It is only logical that roads be routed around critical wildlife habitat and feedgrounds.

Wyoming Game and Fish has identified several areas of critical wildlife habitat. No doubt, areas chosen to site the plants were largely based on prevailing winds and dispersal of emissions. Several facilities are proposed for location on land that is critical wildlife habitat. Would not stringent emission controls allow these facilities to be located in areas less critical for wildlife?

22.5 Directional Drilling: Please explain why one of the best methods for mitigating land disturbance was not included in the DEIS. In the Draft Wildlife Technical Report prepared by ERT, page 2-22 includes an excellent discussion of Exxon's multi-well directional drilling option.

Directional drilling on only Exxon's leases would pare twenty-one drill pads on critical elk range to only eleven. Twenty-seven drill pads to be located on elk calving grounds would be reduced to only nine with multi-well directional drilling.

On TV commercials, oil companies extol the virtues of directional drilling and show pictures of beautiful places that have been spared by this technology. In the final EIS, please examine this issue and include a discussion by company representatives. If all companies use the multi-well directional drilling concept where possible it would seem that total impacts would be greatly reduced.

22.6 Seedskadee National Wildlife Refuge: There are only two national wildlife refuges in Wyoming. The National Elk Refuge is the other. Seedskadee NWR was created as mitigation for river habitat lost to Fontenelle Dam and Reservoir. Paradoxically, Seedskadee was created to mitigate some of the very things being discussed in the DEIS, and yet, oil companies want a part of Seedskadee for their pipeline or railroad.

Seedskadee NWR provides an oasis for wildlife that is being displaced by minerals development in the Green River Basin. But even this haven set aside especially for wildlife, is not sacrosanct to oil companies. Of course, it is cheaper to run a pipeline or railroad through the refuge than to detour across land that is much less critical wildlife habitat. Despite the ads and commercials, I am not yet convinced that many oil companies know the value of anything but a dollar. Seedskadee should be off limits to pipelines and railroads.

22.7 Mitigation Measures, Chapter 4: WF-1. Posting wildlife laws in conspicuous places is logical. But signs will not blunt the increase in poaching and harassment of wildlife that occurs in every area during boom-times. Defenders of Wildlife asks that the companies, acting jointly, fund two game warden positions during construction of the plants and facilities. This would be a very small price to pay for helping to cope with impacts on wildlife that are bound to occur.

22.8 WF-6, regarding mesh wire and scare devices around ponds. Jim June, biologist with Wyoming Game and Fish Department, and I, recovered 42 birds of various species from a mud-pit that was festooned with flapping strips of plastic and loaded with whirligigs strung on wire. And there were other incidents such as this one. Anything attractive and toxic to birds should be covered with a screen.

22.9 WF-8 regarding avoiding certain areas during certain times of the year. We suggest you reassess dates when activities will be permitted around raptor nests. You propose to permit activites around golden eagle, ferruginous hawk, and burrowing owl nests after July 15. Today, July 17, I know of five nesting golden eagles whose young will not fledge for another ten days, and two ferruginous nest with five chicks that are on the same schedule. A burrowing owl I have been photographing has four owlets that will not fledge for at least two weeks. Your dates are highly optimistic.

In the miscellaneous category; "Man Camps" cause problems. Kemmerer city officials have stated the city can house the influx of construction workers that will come to their area. Construction people who live in town become a part of the community and are exposed to Wyoming values that are non-existent in Man Camps.

During the Rock Springs, Evanston boom-days, squatters caused many problems. They camped on waterholes, excluding wildlife and livestock. Some lived off the land (our wildlife), and I have witnessed squatter camps full of children armed with 22 rifles that were blasting away at any kind of wild creature that showed itself. A mechanism is in place through cooperative agreements with state and federal agencies to move these people. Since we have learned from past bitter experience, this problem should not be allowed to occur again.

22.10 Employees should be transported to the plants by bus, and certainly, no firearms should be allowed on company property, including the parking lot and in vehicles on company property.

22.11 The Cumberland area is listed as "high potential" for black footed ferrets. This area should be reinventoried using the latest techniques developed while researching the Meeteetse ferrets.

22.12 An environmental awareness program should be developed to educate employees concerning the vast treasury of renewable resources that exist in Western Wyoming. A combination of education, funding for two additional game wardens, hiring Wyoming citizens first, doing away with man-camp housing, moving squatters before they can drive the first tent peg, regulating the habitat-chomping ORVs, keeping snowmobiles away from critical winter wildlife habitat, firing any employee convicted of a game violation, will help to blunt impacts on our wildlife.

22.13 Further, the major companies should be held responsible for actions of their sub-contractors. Sub-contractors often bid cheap and then take irresponsible shortcuts to complete their work and collect their money. The majors generally contend that they are not responsible for the actions of these contractors, but they should be. Agreed?

Our renewable resources have been short-changed in this DEIS. For those who are only concerned about today, this makes good reading. But if we are to plan for tomorrow, and for the generations who will live here after the oil and gas is gone, we must do a better job. Just now, Wyoming is in the enviable position of having it's cake and eating it too, providing that we are wise enough to preserve those values that can be here forever.

Thank you for inviting our comments.

Dick Randall

Dick Randall
Great Basin representative
Defenders of Wildlife
Box 507
Rock Springs, Wyoming 82901

Responses to Comment Letter 22

22.1 Ongoing mineral-related projects in the Riley Ridge Project area are included as part of the description of the existing environment in Chapter 3 of the DEIS. (Also refer to Appendix C.1 in the DEIS.) Proposed projects that are planned for the project area are included as interrelated projects and are discussed on page 1-53 of the DEIS. Cumulative impacts are discussed for each resource area on pages 4-11 through 4-77 of the DEIS. Cumulative impacts are the combined impacts that would result from the implementation of the Riley Ridge Project and the interrelated projects.

22.2 See Response to Comments 18.3 and 26.2.

22.3 Please refer to Responses to Comments 33.1 and 33.2 and State of Wyoming (27.85). The jurisdiction for helium conservation lies with the Department of the Interior, Bureau of Mines. Presently, national helium reserves are at capacity. The Bureau of Mines has been requested to make a determination on the helium disposition for this project and a decision has not yet been made.

22.4 Thank you for your comment. It will be considered in the final decision making process and approval of access road rights-of-way. For further information on protective measures for streams, please refer to the committed mitigation measures beginning on page 4-131 of the DEIS and Appendix B of the DEIS.

22.5 The BLM and FS agree with this idea and encourage this concept of multiple wells on a single well pad and directional drilling. The agencies will encourage its use where practicable and where necessary to minimize undue or unnecessary environmental degradation. This concept will be utilized on a case-by-case basis where it appears to be functional and appropriate. Please refer to the discussion of directional drilling found on page 1-52 of the DEIS.

22.6 Thank you for your comment. It will be considered in the final decision making process. Also note that the U.S. Fish and Wildlife Service has submitted no formal objections to crossing the Seedskadee National Wildlife Refuge with a pipeline or railroad (comment letter 26). Further note that following Mitigation Measure L-1 on page 4-138 of the DEIS, the railroad would be located outside of the refuge.

22.7 This mitigation measure can not be required by the BLM or FS but will be considered by the Wyoming Industrial Siting Administration as part of its permitting process.

22.8 It is agreed that plastic whirlers would not be completely effective in frightening birds away from the evaporation pond. Additional measures would be used as required by the Authorized Officer. The use of screening to cover the 30-acre pond would be very expensive and might not be practical for engineering reasons.

22.9 Recommended avoidance dates were provided by U.S. Fish and Wildlife Service and were reviewed and approved by BLM and FS raptor biologists. In individual cases where birds may still be on the nest beyond the stated avoidance period, the Authorized Officer may extend the avoidance period.

22.10 These suggestions have been included as uncommitted mitigation measures on page D-3 of the DEIS.

22.11 BLM right-of-way application and special use permit procedures would specify that such studies be conducted by the applicants prior to construction. Current U.S. Fish and Wildlife Service search procedures would recommend pertinent techniques.

22.12 Thank you for your comment. These mitigation measures will be considered as part of the final decision making process. Several of these measures are included as uncommitted mitigation measures in Appendix D of the DEIS. These include an environmental awareness program, funding additional game wardens, and firing employees convicted of job-related game violations. These measures cannot be required by the BLM or FS. Control of squatters, or ORVs, and snowmobiles is part of the normal activities of the BLM and FS. The use of construction camps is a committed mitigation measure that is discussed on page 4-131 of the DEIS.

22.13 The applicants would be responsible for all activities associated with the construction, operation, and abandonment of their projects.

Comment Letter 23

EXXON COMPANY, U.S.A.
POST OFFICE BOX 1600 • MIDLAND, TEXAS 79702

PRODUCTION DEPARTMENT
MIDCONTINENT DIVISION

P.W. HENDERSON
OPERATIONS MANAGER

July 19, 1983

Riley Ridge DEIS -
Exxon Comments

Mrs. J. L. VanWyhe
Bureau of Land Management
Special Projects Staff
3rd Floor East
555 Zang Street
Denver, CO 80228

Dear Janis:

Attached are Exxon's comments on the Riley Ridge Draft Environmental Impact Statement. Our comments address the following items:

- the appropriateness of including CO_2 marketability and royalty payments in an environmental document used in the right-of-way decision making process;
- the effects on the DEIS socioeconomic impact analysis of using more current population data;
- the regional nature of the acid deposition issue and the need to consider contributions from individual sources in defining long term mitigation.

Should you have any questions, please contact Frank Clark.

P. W. Henderson

PWH:jb

Attachment

A DIVISION OF EXXON CORPORATION

Exxon Company, U.S.A.
Comments on the Riley Ridge
Draft Environmental Impact Statement

General

The Riley Ridge Draft Environmental Impact Statement adequately and competently addresses the issues identified during the public scoping process. It, by definition, identifies worst case impacts. It does not, however, discuss sufficiently the benefits which will accrue to the area as the various projects are implemented. Potential benefits which should be further discussed are identified in our comments on the specific resource areas in the following paragraphs.

23.1 The DEIS inappropriately includes in the Summary, discussion of the marketability and potential royalty payments as a long term solution to venting of CO_2. The assessment concludes on page 4-40 that:

> "Significant impacts are predicted for SO_2 and H_2S. As indicated in Table 4-31, concentrations of all other pollutants would not exceed significance criteria."

Since CO_2 was included in the evaluation of "all other pollutants", there appear to be no special measures required to mitigate the environmental impacts of CO_2 venting. Therefore, the issue should be dealt with outside of the EIS and CO_2 marketability and royalty payment considerations should not be included in the decision making process for rights-of-way grants.

Chapter 1 - Description of Proposed Action

23.2 At the bottom of page 1-1 and top of page 1-2, the DEIS discusses the need for a decision to be made concerning the disposition of CO_2. As indicated in the General section above, since there are no significant environmental impacts resulting from venting the CO_2, we believe that a decision should be made outside the environmental impact statement.

23.3 On page 1-3 under Purpose and Need for Project, the DEIS says that "CO_2 can be used for enhancing oil recovery in older oil fields and as a transporting medium in coal slurry pipeline". The use of CO_2 as a transporting medium in coal slurry pipelines is not proven technology and should not be included as a potential use.

23.4 On page 1-51 under the discussion of "Denial of Treatment Plants", the DEIS, in discussing the second option, states that there are "hazards and lack of technology of long distance sour gas transport". We believe the term "long distance" should be clarified. Major concerns are with transporting through major population areas, areas of high risk of damage to lines from digging or industrial activity and booster compressor station equipment failure.

23.5 On page 1-53 under Project Component or Process Alternatives, the DEIS states that "an AMOCO CBA sulphur recovery unit was evaluated and rejected by Exxon prior to filing its application because it can only achieve a 98.6% recovery of sulphur in the tail gas". We believe that a more proper statement is that "an AMOCO CBA sulphur recovery unit was evaluated and rejected by Exxon because of air quality constraints at the two primary sites for Exxon plant facilities".

Chapter 2 - Comparative Analysis of Proposed Action and Alternatives

23.6 On page 2-3, Table 2-1 shows a reduction in mule deer and prong horn winter range disturbance for the Shute Creek Alternative. Based on a comparison of surficial area disturbed, this is correct. However, it appears reasonable to assume that, because of the location of the Big Mesa and East Dry Basin sites in an already developed area, all of the surficial area to be occupied by plants at those sites is not used currently by deer and pronghorn. If so, the net difference in "useable" habitat disturbance is less. Additionally, because project facilities will occupy only a small portion (160 to 180 acres inside the fence) of the land requested in rights-of-way applications, substantial amounts of the habitat at each plant site would still be available to mule deer and pronghorn, which in our experience, adapt readily to human activity. We believe that the difference between the Proposed Action and the Shute Creek Alternative in "useable" habitat (after disturbance) is smaller than shown in the table.

23.7 On page 2-6, the DEIS states that impact from the Shute Creek Alternative would be the least on wildlife and fisheries because of more even distribution of increased population in the study area and the smallest population increase in the Big Piney area near the critical big game range and sensitive trout fisheries. We recognize that the Proposed Action represents the "worst case" for disturbance of wildlife and fisheries in that area of the Wyoming Range. We believe, however, that the Shute Creek Alternative will create impacts to the southern end of the range, and the conclusion in Chapter 2 should be tempered with a statement on those potential impacts.

23.8 On pages 2-1, 2-8, 2-9, 2-10 and 2-11, the DEIS describes the location of the sulfur loadout facility "within the 100 year floodplain". Only a portion of the sulfur loadout site is located within the 100 year floodplain. The railroad siding and railcar loading racks will necessarily be located near the mainline. All other facilities are planned to be located north of U.S. Route 30N outside of the floodplain.

Chapter 3 - Affected Environment

23.9 On page 3-34, the DEIS says that pipeline placement must be below the freeze line to prevent damage. While this is an important consideration for water pipelines, it does not necessarily apply to gas pipelines because hydrate formation will be controlled so that ice will not form. Additionally, flowing gas temperature will be well above freezing. Pipeline design will consider potential for frost heaving.

23.10 On page 3-62, Table 3-32 should be revised under column "Applicant/Project Component Affected" line "FS Bridger-Teton National Forest" to read "Quasar proposed Darby Mountain Unit and portions of proposed North Riley Ridge Unit and portions of Exxon Lake Ridge Unit of the well field area".

Chapter 4 - Environmental Consequences

23.11 Significance criteria, particularly for socioeconomics and wildlife and fisheries should make greater distinction between short and long term impacts. For example, significance criterion #6 for socioeconomics indicates that impacts would be significant if the "demands on public and human services is 25% or greater than under baseline conditions". Then on page 4-7, the DEIS states that significant numbers of health care professionals will be needed in response to increased population growth related to the proposed action. Comparing Table 4-11 with Table 3-14 would indicate that while the impacts in 1986 are probably significant, in 1990 and beyond, the significance criterion has not been exceeded, therefore, impacts in the long term are not significant.

We believe that each of the significance criterion should be examined to determine whether they are applicable in either the short or long term or both and then identified. The analysis should then be reviewed and the impacts evaluated to determine if mitigation measures or siting preferences would be different from those indicated.

Our comments on this chapter are broken down by resource areas as follows:

- Socioeconomics

  - The basis for the following comments include data from the most recent Overthrust Industrial Association (OIA) Monitoring Report.

  - We recognize that the analysis in the DEIS was done to reflect "worst Case" conditions. Our comments are offered, not to suggest reanalysis, but to be considered in tempering conclusions about impacts.

  - Employment/Population

23.12 In the baseline analysis, 1982 populations are low. These populations are based upon 1980 census data which is not current. For example, Kemmerer's 1982 population in the DEIS is listed as 3759. OIA figures, which are based upon an actual count and are exclusive of any man-camp populations suggest there were 4793 people in Kemmerer. The Lincoln Uinta Association of Governments (LUAG) claims a population of over 5200. For LaBarge the 1982 population is estimated in the DEIS at 345 when in fact it is probably closer to 524. Total Lincoln County population in the DEIS is estimated at 13,973 although the actual figure is 16,285.

23.12 (cont.) Because of the lower current population figures, the baseline projections are also low. Additionally, those projections do not appear to consider oil and gas and other energy development in the project area aside from the Riley Ridge projects. We believe that development will take place over the next several decades and projections should include the associated population growth.

- Employment

23.13 The employment impacts attributable to the Riley Ridge projects appear to be high because:

+ induced or indirect employment multipliers appear to be high - 1.90 - 1.95 in 1985/86 vs. 1.18 used in the referenced data base for the same period.

+ oil and gas service employment will exist in the area regardless of whether the Riley Ridge project is developed. They should not be considered exclusively as part of the induced employment figures for Riley Ridge.

Consequently, a portion of the Riley Ridge impact should be allocated to the baseline. It should be noted that such a change would not affect overall population numbers, and therefore, would not affect community service or infrastructure needs. It would, however, affect the portion of needs attributed to the Riley Ridge companies.

This issue has an additional potential effect on the Riley Ridge DEIS. It exaggerates a boom/bust curve for employment and population in the study area. Assuming prices remain stable, we would expect some oil and gas development and associated employment and population in the area through the middle of the next decade. The DEIS suggests instead that Riley Ridge will cause a rapid increase in employment and population and then a rapid decrease. This pattern has significant impacts on local governments and encourages the "quick fix" to temporary population and employment bulges.

- Labor Availability

23.14 Estimated unemployment rates for Lincoln County are low, perhaps as much as 50% under both the baseline and no action alternatives. (It should be noted, however, that these figures probably were correct at the time the research was completed.) The willingness of the Evanston, Bridger Valley and Star Valley unemployed to commute to Riley Ridge appears underestimated. All of these factors lead to an overestimation of the inmigrants required by the projects and, therefore, to an overestimation of impact.

23.15 - Population Distribution

Distribution of population has been estimated probably based on a weighted gravity model. The allocation does not consider the potentially significant affects of employment type, company policies (e.g., housing incentives, single status camps) or community characteristics as determinants of residency locations. This tends in the DEIS to allocate more population to communities with the least ability to handle it, and less population to the communities with the greatest ability to handle it. For example, population allocations to Kemmerer are low, while they are very high for Diamondville and LaBarge relative to their capabilities.

- Public Facilities and Service Standards

23.16 Generally, projected needs are figured on a straight line basis. This does not account for management efficiencies and suggests to a community that it build up staff and equipment to handle peak rather than a long-term population.

- Fiscal Balances

23.17 Revenue generation, particularly for Sublette County, appears to be underestimated by as much as 40%. For example, ad valorem production revenues alone for 2.8 Bcf/day of gas with 20% methane recovery at a mil levy of about 60, yields total revenues of about 24.5 million dollars at a wellhead price for methane of $2.54*/ thousand cubic feet. This compares with a total projected revenue for Sublette County in the year 2000 of 16.8 million dollars. Consequently, benefits from revenue generation of this magnitude have been substantially understated. These benefits in the long term could take the form of:

- lower mil levies county wide

- increased bonding capacity within the county and school district #9

We believe the DEIS should contain a discussion of the potential benefits from surplus revenue generation.

23.18 • Wildlife and Fisheries

Criterion No. 5 of the significance criteria indicates that impacts would be significant if more than 1% of riparian habitat was disturbed during project construction. With the rapidity with which riparian

* Western Research basis for calculating revenues. 1982 average value provided by Wyoming Dept. of Revenue & Taxation, Ad Valorem Tax Division.

23.18 (cont.) habitat can be reclaimed and in view of the phased nature of the development in the well field, it is difficult to imagine that more than 1% of the habitat would be "out of service" at any one time. Consequently, we believe that there are no significant impacts to riparian habitat. Similarly, not all elk critical habitat in the well field will be disturbed simultaneously. Consequently, it seems reasonable to assume that, with phased development of the well field and reclamation efforts, less than 1% of critical range will be disturbed at any one time.

23.19 As described in our comments in the socioeconomic section, it appears that there will be fewer inmigrants and that the percentage of population increases will not be as high as indicated in the DEIS. Therefore, we would expect that all human disturbance related impacts on wildlife and fisheries will be below the levels estimated in the DEIS. The FEIS should include a paragraph acknowledging that impacts are likely to be less because of the reduced inmigration.

23.20 On page 4-17 of the DEIS, the impact analysis assumed a direct linear relationship between critical winter range and population size of the elk herd. An elk population reduction has been predicted based on the number of acres lost in the well field. It does not appear that the feeding of elk at the Finnigan feedground has been taken into consideration in this calculation. It seems reasonable to assume that elk who are feeding naturally in winter range will migrate to the feed ground, resulting in fewer animals lost because of loss of critical winter range.

23.21 Throughout the discussions on animal loss resulting from habitat disturbance and human disturbance, it appears that the following have not been considered in determining impacts:

- the ability of wildlife to adapt to human disturbance. Our experience with our mining operation in Gillette, indicates that both pronghorn and mule deer have excellent abilities to adapt to human activities.

- availability of critical habitat to accommodate additional animals. The analysis assumes that critical habitat is being utilized to the maximum extent possible. Some discussion of the validity of uncertainties associated with this assumption should be included in the FEIS. We believe consideration should be given to herd management objectives and techniques and the role critical habitat plays in herd management.

Refer to our comments on Chapter 2 for additional comments on habitat disturbance.

23.22 On page 4-19, the analysis indicates that there would be an estimated 17% reduction in the overall elk habitat effectiveness. In reviewing the basis for that reduction in the Wildlife Technical Report, the assumption is made that the eastern portion of Forest

23.22 (cont.) Service land including central north Riley Ridge, Riley Ridge and eastern Lake Ridge units would be impacted the most with a 100% decrease in habitat effectiveness. The prediction indicates that habitat effectiveness would be zero after development. The reasons cited were development of new roads and pipelines in areas of good elk summer habitat where no roads currently exist. We question whether habitat effectiveness will be decreased to zero and whether the elk would abandon the entire area as seems to be implied.

23.23 In assessing measures to mitigate reduction in elk habitat effectiveness, we suggest that the timber management program be reviewed to determine if habitat could actually be improved through a selective timber cutting program.

23.24 At the bottom of page 4-28 and the top of page 4-29, the DEIS discusses the effects of H_2S on aquatic life. The statement is made "since H_2S is very toxic to aquatic life, an H_2S pipeline rupture would result in an immediate fish kill". There are no H_2S pipelines associated with this project. The reference to H_2S pipeline rupture should be eliminated and replaced with "sour gas pipeline".

- Health and Safety

23.25 On page 4-31, the DEIS discusses flaring of gas in the event of an uncontrolled blowout. The probability of a blowout is remote as indicated in the Technical Report. Due to the remoteness of the well field, the impacts on people are expected to be minimal. Contingency plans will be developed to control the effects should one occur.

However, it will be virtually impossible to flare the gas for two reasons:

+ the very high CO_2 content of the gas

+ diffusion of the gas cloud immediately upon escape. Even with fuel gas supplemental firing, it is extremely unlikely that the H_2S would be combusted.

Consequently, flaring should not be included as a means for control of H_2S. Instead, emergency plans would be initiated to block access to the immediate area, to monitor H_2S concentrations and to bring the well under control.

23.26 We continue to believe that the prediction of the probability of a pipeline rupture is conservative as discussed in our letter of January 11, 1983, a copy of which is attached. We believe that due to the remoteness of the pipelines, the rural nature of the area, the familiarity of people in the area with pipeline and oil and gas operations, and the depth of burial of pipelines, there is a lower probability of pipeline rupture than predicted in the DEIS.

23.27 • Water Resources

On page 4-36 under discussion of "Abandonment", the following should be added to the discussion on "Groundwater".

+ "The annular space around casing will be cemented as the casing is placed to prevent possible contamination of aquifers. Upon abandonment, additional cement plugs will be placed in the casing to prevent migration of contaminants."

23.28 • Air Quality

We believe that criterion No. 5 under the significance criteria for determining impacts to air quality is inappropriate. The question of H_2S odor threshhold is a subjective one and the literature varies by two orders of magnitude in defining concentrations at which H_2S can be detected. We believe that the Wyoming half-hour average H_2S standards are adequate to ensure that there will be no significant impacts from H_2S odor. Therefore, the criterion of 6.5 micrograms per cubic meter should be eliminated.

We concur with the analysis and the conclusions reached in the discussion on acid deposition in Class I areas on pages 4-45 to 4-48. We believe that impacts predicted are conservative, that is, there is a substantial margin for safety in the modeling results.

23.29 The issue of acid deposition in the wilderness areas is a regional one. Sources such as copper and other metal smelters, power plants, etc. currently exist that contribute to deposition. Although we recognize that it is virtually impossible at this time to predict contributions of these other sources, we believe that mention of the fact in the FEIS that there are other contributors is appropriate and that regional solutions may be required if the monitoring programs show impact to the wilderness areas.

23.30 Some discussion should be included in the EIS of the fact that the pH of "pure" rainwater is 5.6 and that there is the potential for rain and snow alone to affect lake pH. Some perspective on the relative contributions of rain/snow alone and emissions from the plants on lake pH and on the AQRV's should also be included.

23.31 It should be noted that, based on analysis of Tables 2-9, 2-10 and 2-12, the East Dry Basin plant appears to contribute substantially more SO_2 in the wilderness area than do the plants at the other locations. We believe that, because the East Dry Basin plant will be required to comply with the PSD Class II requirements, the potential for deposition, once the Class II requirements are met, will be reduced. We believe that the Final EIS should reflect the fact that PSD requirements will be met and the Class I SO_2 concentrations reduced accordingly. Similarly, for the Shute Creek Alternative, the Buckhorn plant contributes the greatest amount of SO_2 in the wilderness area. Consequently, we recommend that in evaluating mitigation requirements

23.31 (cont.) for each plant, the relative contribution of SO_2 in the wilderness area be utilized to determine proportionate shares of mitigation costs. We also recommend that monitoring programs in the wilderness area recognize relative contribution from each plant site and the timing of construction of the various projects and be developed and implemented accordingly.

- Soils and Vegetation

23.32 On page 4-53, the DEIS assumes that 80% of the roads in the well field would remain in use following abandonment. Given the extent of development and the amount of gas produced over the life of the project, it is unlikely that those roads would be needed for future gas development. Consequently, unless the federal management agencies prefer to keep those roads in use, we would expect almost all of them to be reclaimed at the end of the project. We believe that the 80% figure is very high.

- Visual Resources

23.33 Because the analysis of visual impacts is subjective and qualitative, it is difficult to understand how the significance criteria have been applied in the project area and how the impacts have been determined.

It is particularly difficult to assess the justification for spending a substantial amount of money to mitigate those impacts. We recommend that some discussion of the justification for the cost of mitigation of the impacts be included in the FEIS.

- Wilderness

23.34 The above comment on Visual Resources also applies to Wilderness. It is not evident that the significance criteria have been used to determine significance of impacts. For example, how has the "wilderness opportunity spectrum" supply been analyzed to determine if the total recreation demand exceeds those values? The DEIS states on page 4-65 that "public use of the Bridger Wilderness is currently far in excess of acceptable levels". It further states in the same paragraph that "due to the current situation in the Bridger Wilderness, any project related newcomer use of the area would further deteriorate the wilderness resource and quality of wilderness experience". We assume that the implication is that the projects will have significant impact. Against which of the significance criteria would this further deterioration be measured? Are there quantitative criteria against which expected increased use could be measured? The DEIS further states that the Scab Creek Study Area would also be expected to have its social, physical and biological carrying capacity levels exceeded. We don't understand how those parameters relate to the significance criteria and the basis on which the statement is made.

23.35 Is it correct to include the Lake Mountain Wilderness Study Area in the analysis? Has it been determined that this area will in fact be included in the current round of congressional activity designating wilderness areas?

23.36 The DEIS on page 4-65 also states that the carrying capacity of trails in the area would likely be exceeded because of the projected population related to the project. It is not apparent that any analysis has been done to quantify increases in use of the trails and to determine whether this, in fact, is true.

- Shute Creek Alternative

Our comments for socioeconomic impacts for the Proposed Action apply also to the Shute Creek Alternative.

Our comments on the Health and Safety impact analysis for the Proposed Action apply also to the Shute Creek Alternative.

23.37 From an Air Quality Related Values standpoint, it is difficult to determine whether the Proposed Action or the Shute Creek Alternative has the greater impact. However, based on discussions with the Forest Service, there are some concerns relative to acid deposition in the lakes in the southern portion of the wilderness which they indicated have less buffering capacity than other lakes. Clarification of the relative potential to impact AQRV's for this alternative is required.

23.38 On page 4-112, the DEIS states that visual impacts for the Shute Creek plant remains significant based upon plume visibility. During normal operations, there should be no plume from any of the plants.

- Mitigation Measures

23.39 On page 4-133, Mitigation Measure WF-9 limits construction right-of-way to 25 feet in riparian zones. A 25 foot right-of-way is insufficient for pipeline laying operations. See Figure 2.1-2 in our Project Description. A minimum of 50 feet is required to accommodate stringing equipment and the ditch. We request that this measure be modified to reflect a 50 foot right-of-way.

23.40 Regarding Mitigation Measure WF-10, we believe that establishing a distance from a stream bank at this stage is premature and that the Authorized Officer needs the flexibility to exercise good judgement in the field. We recommend the following change, "Well pads and all other facilities will be located outside of riparian zones where topographically and geologically feasible. When not feasible, the facilities will be located, as approved by the authorized officer, as far from stream banks and associated alluvial and poor draining soils as possible".

23.41 On page 4-134, Mitigation Measure WF-13, we believe that monitoring requirements, station locations, etc. should be determined for the specific disturbance activities in the drainage. This should be covered in the Construction, Operation and Maintenance Plans. We recommend that the second sentence be changed to "Details of specific requirements will be developed in Construction, Operation and Maintenance Plans".

23.42 On page 4-135, Mitigation Measure H-5 requires operators to provide sources of fuel gas to the drill site. As stated in our comments in the Health and Safety section, burning of H_2S in the event of uncontrolled blowout is not possible using a stand-by source of fuel and, therefore, this measure should be eliminated.

23.43 On page 4-135, Mitigation Measure AQ-1, we believe that the cost should be apportioned based on the potential for plants located at the various sites to contribute to acid deposition. See our comments on the air quality impact analysis.

23.44 On page 4-137, Mitigation Measure V-3, 15 or 25kv transmission lines can be placed underground but not without substantial cost. Below is a cost comparison of a 15 kv, 400 amp (6MW) 3ø circuit.

	aboveground	underground
al. wire - 3 leads (500 mcm)	$3-4/LF	$24-30/LF
al. conduit - 3 in. diam. minimum	--	$ 8-10/LF
excavation/installation	$5-6/LF	$18-20/LF
	$18-10/LF	$50-60/LF
	x 5280 ft/mi.	x 5280 ft/mi.
	$42,000-53,000/mi.	$ 264,000-317,000/mi.
insulators & structure @ 500 ft. span max ($600 ea.)	$ 6,000/mi.	--
Total cost per mile	$48,000-59,000/mi.	$264-317,000/mi.

23.44 (cont.) If the electrical line along the 5 miles of Pine Grove Ridge Road were placed underground, the additional cost over an above ground line would be an estimated $1.0-1.25M. We believe that this additional cost is not justified and recommend that the need to bury lines be evaluated on a case by case basis and that costs be included in the evaluation.

23.45 On page 4-138, Mitigation Measure T-2, we will need access in the field at all times. Consequently, roads will have to be constructed for all weather use. Given this fact, the measure should be written to reflect repair of damaged roads not restriction of use. We recommend that this measure be changed to "During adverse weather conditions where serious damage to roads is caused by construction activities, the operator agrees to promptly restore damaged surfaces to the approximate condition that existed prior to the disturbance".

23.1 Please refer to Response to Comments 21.9, 21.10, and 21.12.

23.2 Please refer to Response to Comments 21.9, 21.10, and 21.12.

23.3 Please refer to Response to Comment 21.13.

23.4 Text has been clarified. See Errata Summary for page 1-51 of the DEIS.

23.5 Text has been clarified. See Errata Summary for page 1-53 of the DEIS.

23.6 The comment presents several valid points which were considered but could not be readily quantified in a comparison of alternatives. Assumptions used in the comparison were consistent for all alternatives. The general conclusions presented hold true.

23.7 Based on the comparisons of alternatives, the Shute Creek Alternative would have the least impacts overall to wildlife, even if population-related impacts were shifted to the southern Wyoming Range. The Shute Creek Alternative would have less impact on critical wildlife range particularly.

23.8 Thank you for the clarification. Chapter 2 of the DEIS has been revised as Section 2 of the FEIS.

23.9 Thank you for the clarification. Incorrect sentence has been deleted (see Errata Summary for page 3-34 of the DEIS).

23.10 Please refer to Errata Summary for Table 3-32 on page 3-62 of the DEIS for revision.

23.11 The socioeconomics significance criteria are applicable in both the short term and long term unless specified otherwise. As the DEIS notes, the socioeconomics impacts are expected to be significant and adverse in the short term, but positive and beneficial in the long term (p. viii of the DEIS).

23.12 Consistency of population projections depends upon having a consistent base from which to work. In particular, this means that all numbers be gathered by the same method, be it sampling or otherwise. This same method should be applied over the total area of interest. Only the data of the U.S. Bureau of the Census met these requirements for the Riley Ridge Project. The LUAG numbers, for example, cover only part of the study area. To combine them with estimates from the Census or other sources would produce estimates that would not allow the county-to-county comparisons that are needed for the alternatives analysis.

The baseline figures do not account for known or reasonably certain future projects. Specifically, the baseline conditions against which the impacts of the Riley Ridge Project are analyzed include all existing production and on-going development of sweet gas and oil in the Big Piney/LaBarge area (see pages 1-1, 1-53, and 1-55). All employment and population associated with this development has also been accounted for. Consistent with the worst-case analysis, possible future projects for which there is no current activity are excluded from the analysis.

23.13 The baseline against which the Riley Ridge impacts were assessed includes continuation of all activities, particularly oil and gas, that are currently underway (see page 1-1 of the DEIS). In order to quantify this activity, MMS records were reviewed to determine a schedule for development of the area's oil and gas resources. On the basis of this review, it was projected that 70 wells per year would be drilled in Sublette and northern Lincoln Counties. Of these, 30 percent, or 21 wells per year would be in the Riley Ridge well field. All employment, both direct and indirect, as well as population associated with this activity was included in the baseline.

For purposes of judging cumulative socioeconomic impacts, the Riley Ridge Project was compared to a scenario which was composed of the previously defined baseline plus interrelated projects. The latter are projects which have a reasonable likelihood of occurring, which would begin construction in 1984 or later, and would compete for the same labor force (see Table 1-19 on page 1-54 of the DEIS). Comparing these two definitions and the list of interrelated projects indicates that the oil and gas activities in question have been included in the baseline. Consistent with the worst-case analysis, more speculative development is not considered under either scenario.

23.14 The employment analysis has assumed that workers are willing to commute up to two hours to the work site (DEIS, page 3-1). This is based on experience in other similar areas (EPRI 1982). Should workers from Evanston, Star Valley, and Bridger Valley be willing to commute a longer time on a daily basis, the impacts would be lessened. It is anticipated, however, that they would commute on a weekly basis and live in single status camps or seek other temporary accomodations in the project area.

23.15 To the extent that companies have committed to various housing incentives, they have been included in the analysis (page 4-4 of the DEIS). A detailed explanation of the use of the weighted gravity model and how the effects of single status camps and community characteristics are factored in is contained in Appendix A, pages A1 through A5, of the Socioeconomic Technical Report.

23.16 The estimation of future public needs is based on the assumption that current service ratios will continue into the future. To assume various management efficiencies or community willingness to deal with short-term changes in ratios and potential degradation in service, would not be consistent with a worst-case analysis.

23.17 At issue in the DEIS is whether there is a tax/revenue base sufficient to support increased service needs. The potential for a revenue surplus under current tax conditions is shown in the DEIS. Speculation as to changes that could result from such a situation could be misinterpreted and misleading and so are not appropriate for inclusion in the DEIS.

23.18 Significance criteria were developed in consultation with Wyoming Game and Fish Department and FS personnel. All habitat disturbances were considered as additive so as to constitute the worst-case impact as directed by the NEPA process. Much of the area disturbed would be converted into roads, well pads, and other facilities areas that would not be reclaimed for the life of the project. Elk critical range, even though reclaimed, would take many years (15 years assumed) to regenerate to suitable habitat, thus methods used to determine significance are justifiable.

23.19 This issue is discussed in the Summary of the FEIS and on page 1-1 of the DEIS. If development proceeds at a slower rate, the impacts identified in the DEIS that would result from the influx of new population can be considered a worst-case situation.

23.20 It is correct that impact analysis assumes a direct linear relation ship between critical winter range and population size of the elk herd and that feeding of *additional* elk at Finnegan feedground was not considered to be a factor in reducing this impact. The Wyoming Game and Fish Department policy and objectives are concerned with maintenance of critical winter range and do not include additional food supplies or feedgrounds. Thus, the EIS could not assume more elk fed on the feedground and must equate habitat loss with population reduction.

23.21 The adaptive ability of certain species, particularly pronghorn and mule deer, were considered in predicting impacts; see especially the impact analysis assumptions provided on page 3-5 of the Wildlife and Fisheries Technical Report.

Critical winter range, by definition, is the range which limits population size. Therefore, it stands to reason that critical range cannot accomodate additional animals during years of severe winter weather. Consideration was given to herd management objectives and the role of critical range and resulted in the assumptions used in the impact analysis.

23.22 The methodology used in assessing impacts to elk spring-summer-fall range follow a series of mathematical formulas developed through elk habitat modeling (please review pages 3-7 through 3-29 of the Wildlife and Fisheries Technical Report). Application of this FS methodology yields a habitat effectiveness value of zero. This does not mean that elk would abandon the entire area and no statement is made to this effect. This methodology is the best available to quantify impacts to elk spring-summer-fall range but its application must be tempered with professional judgement.

23.23 The FS will assess the combined effects of its timber program and the Riley Ridge Project on wildlife habitat. Where well field access roads could be used for timber harvesting, adverse effects on elk habitat effectiveness could be minimized. Selective cutting could have a similar mitigating effect.

23.24 Thank you for comment. See the Errata Summary for page 4-29 of the DEIS revisions.

23.25 Thank you for the clarification. No change in the text is necessary because blowout modeling was conducted assuming that the H_2S would not be combusted. This would result in a worst-case situation for potential health and safety effects.

23.26 It is agreed that the pipeline rupture probabilities used in the DEIS are conservative and represent a worst-case situation. It was not deemed possible to quantify the effects of remoteness and public familiarity or rupture probability. Therefore, the conservative estimates were used.

23.27 Additional description has been placed in the Errata Summary for pages 1-18 and 4-36 of the DEIS. Proper well engineering would ensure a competent casing seal. Placement of plugs is described on page 1-35 of the DEIS.

23.28 The commenter is correct in his statement that there is wide variation in the literature regarding H_2S odor thresholds. The significance criteria selected for the EIS are derived from the approximate mid-range of H_2S odor thresholds quoted in the literature, whereas the Wyoming standards fall near the upper end of this range. For this reason, it is felt that the mid-range value of 6.5 micrograms/cubic meter is a more reasonable H_2S odor signifi cance criteria. Please refer to page 2-12 of the Air Resources Technical Report for further discussion of this issue.

23.29 It is agreed that acid deposition is a regional issue. The intention of the air quality related values action plan would be to characterize existing acid deposition in the Bridger Wilderness prior to the start-up of emissions form the Riley Ridge plants. This would enable the FS to more accurately identify the sources of potential problems, which might or might not be the Riley Ridge plants. The introduction to the Air Quality Related Values Action Plan in this final EIS discusses the regional nature of acid deposition.

23.30 The impact of existing or natural sources of acid deposition is reflected in the baseline pH and alkalinity measurements of the lakes studied in this analysis. Only incremental acid deposition fluxes from new sources would impact lake pH. Comparisons of existing deposition to the calculated acid flux generated by the Riley Ridge Project would be inappropriate. Although the wet acid deposition from natural sources could be estimated by assuming a precipitation pH of 5.6, there is no way to estimate dry deposition from natural sources. The deposition fluxes calculated from Riley Ridge sources include both wet and dry deposition. (See also Response to Comment 28.19.)

23.31 The commenter correctly points out that if emissions are reduced from plant sites to comply with Class II PSD increments that there would be a corresponding reduction in acid deposition fluxes. However, whether emissions reductions will in fact be necessary will be determined during review of the PSD permit (see Response to Comment 18.3). The commenter erroneously implies all Class I impacts are dominated by a single plant. While it is true that a single plant contributes to most of the impacts for the impacts for the worst-case situation, it is not necessarily correct to extrapolate this finding to other receptor locations or meteorological scenarios. Relative plant contribution is strongly dependent on receptor location and the particular meteorological conditions under which impact occurs.

23.32 Please refer to Response to Comment 21.26.

23.33 Please refer to Appendix C.2 in the DEIS for a detailed discussion of the methodology used in the visual resources inventory and impact analysis. It is agreed that this analysis is somewhat subjective and qualitative; however, quantitative differences among alternatives are presented on page 2-4 of the DEIS.

The costs of mitigation measures are not analyzed in the EIS but they are considered in the final decision making process. Cost information of the type that is contained in Comment 23.44 can be submitted to the BLM and FS, and it will be considered prior to final approval of mitigation measures in the Record of Decision.

23.34 The FS, Bridger-Teton National Forest, has for several years been monitoring the use and impacts to the wilderness resource and quality of the wilderness experience from the biological, physical, and social perspective. Utilizing the Wilderness Opportunity Spectrum, demand is currently exceeding supply for each of the four use zones within the Bridger Wilderness. Significance criteria #1, page 4-64, is the criterion to measure the impacts based upon years of research done by the FS on carrying capacities, and the direct observations by wilderness backcounty rangers who are intimately familiar with the increased use to the Bridger Wilderness and associated impacts. The same rationale would apply to the Scab Creek Study Area.

23.35 As stated on page 4-65 of the DEIS, the BLM under Section 603(c) of the Federal Land Policy and Management Act (FLMA) is required to manage Wilderness Study Areas "so as *not* to impair the suitability of such areas for preservation as wilderness...". Because Exxon's Graphite Unit overlaps a portion of the Lake Mountain WSA with proposed wells (two), access roads, and a buried pipeline gathering system located within the WSA, wilderness characteristics (i.e., wilderness) could possibly be in conflict with the "non-impairment criteria". Therefore, due to this proposed direct impact upon wilderness characteristics, it is appropriate to include the Lake Mountain WSA in the analysis.

It is unknown how the reviewer is defining the "current round of congressional activity designating wilderness areas." No Congressional hearings are anticipacted during the 98th Congress regarding whether or not the Lake Mountain WSA be added to the National Wilderness Preservation System or returned to other multiple uses.

23.36 No quantification was attempted at this time. However, public use of trails in many areas currently exceeds acceptable levels. Therefore, any increases in use will further exceed these limits. Trail use is only one aspect of Wilderness, in all the increase in population will impact the resource. See page 4-66 of the DEIS.

23.37 Tables 4-36 on page 4-37 and 4-84 on page 4-110 of the DEIS provide a quantitative comparison of potential acid deposition impacts between the Proposed Action and Shute Creek Alternative. At all three lakes analyzed, potential pH changes were predicted to be less under the Shute Creek Alternative, although insignificant in both cases. No conclusive data currently exist which indicate that there is a significant difference in buffering capacity between lakes in the northern and southern ends of the wilderness. The Air Quality Related Values Action Plan contained in this final EIS would generate additional data on buffering capacity.

23.38 Thank you for your clarification. This statement was made based on a misunderstanding of Exxon's design. The statement has been deleted. See the Errata Summary for page 4-112 of the DEIS.

23.39 The last sentence of the paragraph states, "Variances to this must be approved by the Authorizing Officer." Any requests for variance will be reviewed and ruled on when the Construction and Use Plan and right-of-way grants are approved.

23.40 WF-10, as stated on page 4-133 of the DEIS, gives the Authorizing Officer the flexibility to approve any locations.

23.41 The monitoring requirements, etc., will be developed in the Construction and Use Plan as outlined on page 1-12 of the DEIS. Since this has been covered in several places in the DEIS, we do not see the need to state it for each measure.

23.42 The measure only requires that sources be identified. The H_2S contingency plan will address, on a case-by-case basis, whether the gas would be useful in reducing H_2S related risks.

23.43 It seems reasonable that the costs should be divided by some "fair share" method which should be worked out when the monitoring plan is implemented.

23.44 The need to bury lines will be evaluated on a case-by-case basis. The estimated cost difference will be considered in the final decision making process.

23.45 Decisions on use will be made on a case-by-case basis by the Authorizing Officer.

Comment Letter 24

Box 147
La Barge, Wyo. 83123
7/16/83

Mrs. Janis Van Wyhe
Riley Ridge Project Manager
BLM, Division of EIS Services
555 Zang St.
1st Floor, East
Denver, Colo. 80228

Dear Mrs. Van Wyhe

Upon reviewing the EIS for the Riley Ridge Natural Gas Project, we are concerned with the locations of the pipelines and transmission lines in accordance with the emigrant trails in our area and would like to see them protected from destruction.

From the Names Hill area south through the Slate Creek area, much of the trail is still in its natural state. These trail ruts are some of the best of what are left that cross our country. It would be a shame to destroy these the way the rest have been.

24.1 We would like to see that any construction for pipeline and transmission lines stay completely away from the Names Hill and Holden Hill trail areas. From the looks of the maps, this construction would follow almost parallel to and/or on top of the main Sublette Trail. Some of the trail has already been destroyed by pipelines in this area and we would not like to see the remaining segments meet the same fate. If these lines have to go through, we would like to see them moved further west another 8 to 10 miles.

Also, we would like to see that the number of crossings of any segment of any of the trail be limited to once. There is enough open country in the area that one crossing would be enough without crossing and recrossing the routes. Why not put all pipelines and transmission lines in one corri or instead of having each go where it likes? That way only a small portion of ground would be torn up instead of being torn up in 3 or 4 different places. 24.2

In closing, we would like to ask that you give careful consideration to the overland routes and help to protect what history we have in our area.

Sincerely,

Chester & Karen Buck

Responses to Comment Letter 24

24.1 See Response to Comments 1.1 and 1.2.

24.2 Thank you for your comment. It will be considered in the final decision making process. It is BLM's policy to encourage the use of common corridors for transmission lines and pipelines where possible. The origin, destination, and engineering constraints of a facility will be considered when the BLM reviews a final right-of-way application.

Comment Letter 25

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON 20426

IN REPLY REFER TO:

Ms. Janis L. VanWyhe
Bureau of Land Management
Division of EIS Services
555 Zang Street
Denver, Colorado 80228

JUL 19 1983

Dear Ms. VanWyhe

The environmental staff has reviewed the Draft Environmental Impact Statement (DEIS) for the proposed Riley Ridge Project. Enclosed are our comments. These comments are based upon the DEIS and technical support documents that have been written. If you should have any questions regarding these comments, or would like my staff's assistance, please do not hesitate to telephone Dr. John F. Korzeniowski at (202) 357-9046.

Sincerely,

Richard R. Hoffmann

Richard R. Hoffmann, Chief
Environmental Evaluation Branch

Enclosure

OPPR
Korzeniowski, J. :dln
7/18/83

cc: Mr. Lazarus
EEB Files

ENCLOSURE

REVIEW COMMENTS

25.1 1. As a natural gas development project, the Riley Ridge Project would require construction of sales gas pipelines by Northwest Pipeline Corporation (Northwest), Exxon Company, U.S.A. (Exxon), and American Quasar Petroleum Company (American Quasar). On page 4-74, under "Pipeline System," the DEIS also discusses the possibility of constructing additional pipeline facilities to be associated with the Northwest and Trailblazer systems. Construction of all these facilities may require authorization from the Federal Energy Regulatory Commission (FERC). Therefore, the description provided in table 1-1 on page 1-7 ("Key Federal Authorizing Actions"), should be revised as follows:

Authority	Project Feature
Section 7(c) of the Natural Gas Act; 18 CFR Section 2.102; Section 110 of the Natural Gas Policy Act of 1978; FERC Orders No. 94 and 94-A.	Recovery of the costs for treatment plant; sales gas pipelines used to transport natural gas in interstate commerce.

25.2 2. The DEIS does not discuss the criteria used to develop the proposed or alternative routes for the sales gas pipelines proposed by Northwest, American Quasar, and Exxon. In addition, the DEIS does not provide the rationale for locating the proposed tie-in between the American Quasar and Exxon sales gas pipelines and the Trailblazer pipeline southwest of Rock Springs or for locating the CO_2 line to this same location. Map 3-9 on page 3-61, "Existing Pipelines and Railroads," indicates existing pipeline rights-of-way extending in a general north-south direction that could be used for both the American Quasar and Exxon sales gas pipelines and CO_2 pipelines. These alternative routes could tie-in to the Trailblazer system 35 to 50 miles west of the proposed tie-in location and could shorten these pipelines.

25.3 3. The DEIS should identify the potential market and transporter for the byproduct carbon dioxide (CO_2) stream.

25.4 4. The FEIS should include a "Conclusions" section describing the quantitative process BLM used to choose its preferred alternative. In addition, the reason why all other alternatives were eliminated should be identified.

25.5 5. The DEIS fails to identify, as did the PDEIS, the potential danger to the proposed aboveground facilities, pipelines, and well pads from geological hazards and to identify any active faults in the project area.

25.6 6. The FERC environmental staff agrees that mitigative measure H-1 should be adopted as a condition to all right-of-way permits for sour gas trunklines. The staff cautions that the economics of block valve spacing (a minimum distance of 1 mile has been proposed in mitigative measure H-4) where the sour gas trunkline passes near urban areas should be considered and discussed in the FEIS. In addition, the FEIS should include a detailed description of the automatic shutdown sequence proposed for each sour gas pipeline in the event of a pipeline rupture.

7. The FERC environmental staff agrees with mitigative measure H-2 that would require automatic shutdown valves at each sour gas wellhead to close in the production well(s) or isolate them from the sour gas gathering system if a well blew out or a gathering system ruptured.

25.7 8. For the Proposed Action, Buckhorn Alternative, and Shute Creek Alternative, the FEIS should identify why Northwest's proposed 138 kilovolt powerline could parallel the right-of-way proposed for American Quasar and Exxon's 345-kilovolt powerline to the general vicinity of Northwest's Craven Creek site.

25.8 9. For the Shute Creek Alternative, the FEIS should discuss feasibility of rerouting the sales gas pipeline and CO_2 byproduct pipeline south or north of the Seedskadee National Wildlife Refuge.

25.9 10. The FEIS should identify the potential market for the sulfur byproduct from each conditioning plant.

25.10 11. The FEIS states that Northwest could not site its proposed conditioning plant adjacent to its Opal natural gasoline plant because the designs are incompatible. These incompatabilities should be identified.

25.11 12. The FERC environmental staff believes that the BLM should adopt the component alternative for the Shute Creek Alternative that would extend the railroad spur from Northwest's Craven Creek site to the Shute Creek site. This would allow Northwest and Exxon to remove sulfur jointly and would eliminate the need for of Exxon's proposed aboveground molten sulfur pipeline.

25.12 13. The technical report for health and safety fails to address the safety risks that could occur if a multiple directional wellhead blew out. The quantitative method used to assess the potential impact posed by singular wellhead blowouts should be applied to multiple wellhead blowouts.

25.13 14. The FERC staff recommends that an alternative be examined that would locate all conditioning plants in the southern portion of the project area. A prudent choice would require relocating American Quasar's plant as proposed in the Shute

25.13 (cont.) Creek Alternative to a site within the general vicinity of Exxon's Shute Creek site and Northwest's Craven Creek site, thereby eliminating the need for an aboveground molten sulfur pipeline and potentially resulting in a single sour gas trunkline south to the plant sites.

25.14 15. Errors were made in summing totals in table 1-20 for the years 1988, 1989, 1994, and 1995-2000. Also, in table 2-1, the percentage change in Kemmerer's population for the Shute Creek Alternative should be 14 rather than 4.

25.15 16. The cultural resources technical report prepared by Metcalf-Zier for the Riley Ridge Natural Gas Project on behalf of the BLM consists of data available from previous archaeological reconnaissance in the project area, supplemented by some field surveys where historic trails are thought to be. As such, it is an adequate first step. The technical report should be modified to specify which areas require further data prior to construction and the method by which these data would be obtained. In the absence of this modification, it would be difficult to envision the specific uses for the information in the technical report.

Responses to Comment Letter 25

25.1 Revision has been made. See Errata Summary for Table 1-1 on page 1-7 of the DEIS.

25.2 The pipeline routes and tie-in points analyzed in the DEIS were provided to the BLM in the applicants' right-of-way applications. The selection of these routes was not part of the EIS process. The rationale for the location of these facilities was primarily engineering, economic, and environmental considerations; however, a complete discussion was not deemed necessary for the DEIS. In the case of the tie-in point to the Trailblazer Pipeline system, the proposed tie-in is at an existing compressor station west of Rock Springs. Additional routes may be considered before granting.

25.3 CO_2 markets are currently being investigated by the applicants, but none were identified at the time the final EIS was completed.

25.4 There is no need to document this type of information in an EIS since an EIS is not a decision document. The conclusions and the basis for the conclusions will be given in the Record of Decision.

25.5 A discussion of geologic hazards can be found on page 1-4 of the Health and Safety Technical Report. In summary, the area is characterized by low fault activity and geologic hazards have been included in the probability assessment for well blowouts and sour gas trunk line ruptures.

25.6 Economics are not considered in spacing. Spacing is used to analyze the risk to Health & Safety. See pages 4-30 through 4-34 of the DEIS and the Health & Safety Technical Report.

Impacts from a pipeline rupture were based on a worst-case complete rupture. A shutdown sequence would reduce those impacts and will be included in the Construction and Use Plan.

25.7 The transmission line routes to Northwest's Craven Creek plant site and the Dry Basin area (Exxon and Quasar) were analyzed as they were presented in the respective right-of-way applications. It should be noted that the final locations of these right-of-ways will be determined by Utah Power & Light and the BLM. At the time a new transmission line is needed, UP&L would examine load size, load location, and system reliability needs before finalizing a transmission line voltage level and route. At that time, parallel rights-of-ways could be a possibility.

25.8 Since the U.S. Fish and Wildlife Service did not have specific objectives to crossing the Seedskadee National Wildlife Refuge with pipelines (see comment letter 32), alternative pipeline routes were not investigated. Mitigation measure WF-4 on page 4-132 of the DEIS deals specifically with potential impacts to the refuge. If FWS identified significant problems with crossing the refuge, it could request that Exxon relocate the pipeline routes. Such a change would require additional analysis on the new sections or route.

25.9 Markets for the sulfur by-product are being investigated by the applicants, but have not yet been identified.

25.10 The compatibility of the two operations was an engineering decision made by Northwest prior to submitting its right-of-way application. Details of this decision were not included in the application. Since Northwest did not propose a plant adjacent to its Opal site and since the EIS analysis did not identify any unacceptable impacts for the Craven Creek site, further evaluation of an Opal site was not conducted.

25.11 Thank you for the comment, it will be considered in the final decision making process.

25.12 There are no "multiple directional wellheads" proposed as part of the Riley Ridge Project. Where directional drilling of more than one well per well site has been proposed (Quasar in the proposed Darby Mountain Unit), each well would be drilled separately and would have separate production facilities. Thus, the release of sour gas from more than one well resulting from a single blowout is very unlikely.

25.13 While a southern alternative would eliminate some impacts, it would compound the air quality impacts (based on preliminary modeling) and therefore, was not considered as a viable alternative.

25.14 Revision made (1994 is correct). See Errata Summary for Table 1-20 on page 1-57 of the DEIS and Section 2, Comparative Analysis of Proposed Action and Alternatives.

25.15 The Cultural Resources Technical Report was indeed intended to be a "first step" that would summarize existing information. As stated on page 4-62 of the DEIS, a formal compliance plan will be developed for cultural resources prior to the start of project construction. This plan will deal with additional survey work for areas of proposed disturbance, evaluation of the significance of identified resources, and mitigation measures for resources which could be directly or indirectly disturbed.

Comment Letter 26

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
2120 Capitol Avenue, Room 7010
Cheyenne, Wyoming 82001

IN REPLY REFER TO:

July 19, 1983

Memorandum

To: Project Leader, EIS Office, Bureau of Land Management, Third Floor East, 555 Zang Street, Denver, Colorado 80228

From: Project Leader, Ecological Services

Subject: U.S. Fish and Wildlife Service (FWS) Comments on Riley Ridge DEIS

This responds to your May 20, 1983, request for our review and comments on the subject DEIS. Our comments represent the consolidated input of ecological services, wildlife resources, and endangered species which are all divisions within the FWS.

We have the following specific comments.

	Page	Paragraph	Comments
26.1	x	3	Quasar should meet SO_2 and H_2S emission standards. The other companies involved with similar size gas treatment plants can meet the standards; therefore, we recommend that Quasar do likewise.
26.2	1-13	3	Best available control techniques should dictate air pollution control measures.
26.3	1-21	2	We recommend disposal of waste at the Department of Environmental Quality (DEQ) approval disposal site rather than onsite disposal. This would help prevent accidental discharge of wastes into area streams and eliminate toxic conditions for wildlife and migratory birds.
26.4	1-21	3	Gravel/riprap should not be obtained from riparian or wetland areas.

	Page	Paragraph	Comments
26.5	1-34	6	If water in the 30 acre evaporation pond is toxic to wildlife, it should be disposed of in an alternative manner that would eliminate hazards to wildlife.
	1-37	3	Refer to comments on 1-34
26.6	1-39	11	If water in the 10 acre evaporation pond is toxic to wildlife, it should be disposed of in an alternative manner that would eliminate hazards to wildlife.
26.7	1-59	Table 1-24	We question why Quasar's H_2S and SO_2 emissions should be significantly higher than Exxon's or NW/Mobil. We recommend Quasar comply with air quality standards.
26.8	2-6	5	Ground water sources may be preferable to surface water sources. We recommend that the companies consult with Wyoming Game and Fish Department (WGFD) to determine if alternative water sources should be utilized to prevent adverse impacts to aquatic resources.
26.9	2-6	6	Quasar proposed to violate PDS class II for SO_2. Quasar should be able to meet standards similar to the other companies. Acid rain is a potential problem in the Bridger Wilderness Area and to area aquatic life and vegetation.
26.10	4-19	Table 4-23	The actual impacts on wildlife far exceed the acreage of habitat eliminated by roads, plant sites, and well fields. Habitat adjacent to these facilities will have diminished value to certain wildlife species due to human presence and human caused disturbances. The FEIS should evaluate these impacts and indicate their effects on wildlife.
26.11	4-20	1	An important mitigation measure to lessen human induced wildlife impacts would be to assist WGFD with funding for additional enforcement personnel. Another measure would be to conduct I/E sessions during company employee orientation to inform employees on how to avoid human/fish and wildlife conflicts. Details of such a plan should be coordinated with WGFD.

	Page	Paragraph	Comments
26.12	4-20	10	All these fishery impacts can be mitigated, and we recommend coordination with WGFD to eliminate them.
26.13	4-21	1	According to WGFD, Beaver Creek has the only indigenous pure strain of Colorado River cutthroat trout in the oil field but transplants have been made into three other streams: Pine Grove Creek, Fogarty Creek and Black Canyon Creek. The other streams mentioned have varying degrees of stock purity, but we still feel they warrant protection.
26.14	4-24	4	Surface water sources for hydrostatic testing should be coordinated with WGFD to prevent impacts to aquatic resources.
26.15	4-26	5	The 30 acre evaporation pond that is toxic to wildlife should be eliminated by requiring Northwest to dispose of it in another manner such as deep well injection or installing a waste water treatment plant. The proposed toxic pond will be a hazard to shorebirds and waterfowl that migrate at night.
26.16	4-29	1	We recommend that automatic pipeline shutoffs be installed for both molten sulfur and sour gas lines at stream crossings to prevent substantial amounts of toxic material from entering watercources in the event of a pipeline rupture. This is especially important to protect fishery resources of the Green River, Fontennelle and LaBarge Creeks.
26.17	4-132	WF-6	The effectiveness of plastic "whirlers" especially at night in keeping waterfowl and shorebirds out of the toxic 30 acre treatment plant is questionable. A better solution is to find an alternate disposal method as discussed in comment 4-26.

	Page	Paragraph	Comments
26.18	4-131	Mitigation	Many excellent lease stipulations are included in Appendix B.2-B.7 that will be required on federal lands. We highly recommend that they also be implemented on private lands and be included as either mitigation measures or applicant's standard operating procedures, especially conditions B.5-27 through 36 and erosion control, revegetation and restoration guidelines (B.7). In addition, we recommend that the companies and the lead federal agencies coordinate closely with WGFD in order to select stream crossings and drilling sites that will minimize damage to riparian and aquatic resources.
26.19	4-133	WF-8	We concur with the raptor mitigation plans. In addition, we recommend that the companies be required to conduct raptor inventories along all rights-of-way prior to the nesting season if construction activities would occur during the protective periods. Nest information should be provided to WGFD and FWS.
	4-135	AQ-2	We encourage implementation of AQ-2.
	Appendix B		BLM's "required federal measures and applicant's standard operating procedures designed to reduce environmental impacts" may provide excellent protection to fish and wildlife resources if they are adequately enforced. Therefore, we encourage BLM and Forest Service to obtain adequate enforcement staff to ensure enforcement of these regulations.

We have reviewed the DEIS for compliance under the Endangered Species Act, as amended. More detailed comments on the effects of this project on endangered and threatened (T/E) species will be covered during consultation under Section 7 of ESA.

26.20 We have previously provided an amended species list which included the humpback chub and Colorado squawfish. We suggest this revised list be noted in the FEIS along with the biological assessment and any biological opinion provided on this project.

The direct and indirect impacts of this project and the cumulative effects of this and other proposed or on-going projects in the proposed area should be addressed in the biological assessment and decision of "may effect" or "no effect" on listed threatened and endangered species. We have identified the following issues for your consideration in preparing this biological assessment and decision.

Black-footed Ferret

1. The biological assessment should address:

   a. disturbance to prairie dog towns (direct/indirect), such as noise, vehicle traffic, surface disturbance, shooting and other recreation uses of prairie dog towns, as well as construction of transmission lines in potential ferret habitat that may increase the ability of raptorial birds to prey on black-footed ferrets.

   b. loss of management options in areas containing complexes of prairie dog towns that may serve as black-footed ferret recovery areas.

2. Black-footed ferret surveys will be required in all towns that may be disturbed by proposed actions or the avoidance of prairie dog towns. FWS black-footed ferret survey guidelines are minimum requirements for ferret surveys.

Bald Eagles/Peregrine Falcons

1. Activities proposed in riparian habitat should:

   a. avoid unnecessary destruction of trees

   b. minimize destruction of riparian vegetation by using existing rights-of-way (ROW) and utility corridors or identifying the smallest possible ROW for the proposed activity.

   c. avoid establishing permanent facilities in riparian areas with known or potential value to listed raptors.

2. Buffer zones should be established around roosts and feeding areas used by bald eagles.

3. Activities in eagle use areas and potential peregrine migration corridors (riparian areas and wetlands) should have seasonal restrictions to avoid unnecessary disturbances during use periods.

4. Above ground powerlines (less than 69 KV) should be raptor proofed and constructed and located to maximize visability to avoid electrocution and collision hazard.

5. Powerline crossings over rivers, lakes, and reservoirs, should follow the preceding comment and utilize existing utility corridors whenever possible.

Whooping Cranes

1. Disturbances to lacustrine and riverine wetlands, especially those near croplands should be avoided.

2. Above ground powerlines should be located and constructed to maximize visability and minimize collision hazards near areas described in the preceding comment and where cranes are known to have visited or frequented in the past.

All Species Listed Above

The impacts of additional recreational uses in habitat important to all listed species should be addressed. We are concerned about illegal shooting (taking) of these species and possible mitigation measures to reduce these impacts as a result of the influx of people to construct and support this project.

Colorado Fishes

The cumulative impacts resulting from depletions of water from the Green River Drainage Basin should be addressed during Section 7 Consultation.

Our refuge division is concerned about actions that may affect Seedskadee National Wildlife Refuge. The eight mile railroad corridor in the "component option" could cause significant impacts upon wildlife and the refuge division discourages this option. Buried pipelines which may cross the refuge will require a right-of-way permit(s) from FWS. We also recommend that the companies coordinate closely with refuge personnel to safeguard important wildlife and cultural resources on refuge lands.

Based on our review of the DEIS, we recommend that the Shute Creek alternative be selected as the preferred alternative. This alternative would eliminate the development of gas sweetening plants in critical big game winter range. In addition, of the three alternative transmission line routes proposed, we prefer the BLM proposal since it more closely follows existing rights-of-way and would be least damaging to wildlife habitat.

Please contact this office or our Endangered Species Field Office in Billings, Montana for further coordination or input by the U.S. Fish and Wildlife Service.

Arthur Anderson

cc:
Regional Director, Denver, Colorado (ES)
Field Supervisor, Billings, Montana (ES)(SE)
Bureau of Land Management, Cheyenne, Wyoming
Bureau of Land Management, Rock Springs, Wyoming
Wyoming Game and Fish Department, Cheyenne, Wyoming
Office of the Secretary, Department of the Interior, Denver, Colorado
(Attn: Bob Stewart)
FWS/EC, Washington, D.C.

Responses to Comment Letter 26

26.1 Quasar would comply with all applicable air quality standards. As indicated on page x of the DEIS, modeling would be refined using on-site meteorology and Quasar would also refine its treatment plant design.

26.2 Definition of Best Available Control Technology (BACT) is the responsibility of the Wyoming Department of Environmental Quality and will be determined at the time of the PSD permit. See Response to Comment 28.3.

26.3 The applicants have not proposed on-site disposal of wastes. Wastes would be trucked to an approved disposal site.

26.4 The locations of gravel resources for the project have not been identified. Any gravel sources on public lands must be approved by the land-managing agency. Sufficient gravel sources in the area should prevent use of materials from riparian or wetland areas.

26.5 Thank you for your comment. It will be considered in the final decision making process. Water in the 30-acre evaporation pond would be toxic to wildlife, so mitigation measure WF-6 found on page 4-132 of the DEIS was developed to reduce impacts to wildlife. This measure would probably not be completely effective in preventing mortality of migratory birds. The Authorized Officer will decide if an alternative disposal method is required prior to approving a right-of-way.

26.6 Water in the 10-acre evaporation pond would not be toxic to wildlife.

26.7 Each applicant has designed a gas treatment plant based on their own engineering requirements. Differences between Quasar's emissions and those of the other applicants are due to differences in the process technology proposed. Quasar would comply with all applicable air quality standards.

26.8 Water sources were analyzed as they were presented in the applicant's right-of-way applications. Mitigation measure WF-12 on page 4-134 of the DEIS requires that Northwest consult with Wyoming Game and Fish Department on the design of the intake structure in the Green River. While significant adverse impacts to aquatic resources are not anticipated, alternative water sources would be investigated as necessary.

26.9 Quasar would comply with all applicable air quality standards. Section 2 of the FEIS has been modified to clarify this situation. The effects of acid deposition have also been added to Section 2 of the FEIS.

26.10 Both the DEIS and final EIS have considered the impacts to adjacent habitats due to human presence and associated disturbances. See assumptions used in impact analyses presented on page 3-5 of the Wildlife and Fisheries Technical Report.

26.11 These suggestions were included as uncommitted mitigation measures on page D-2 of the DEIS.

26.12 Many impacts to fisheries can be mitigated. These mitigation measures are discussed beginning on page 4-133 of the DEIS. Accidental impacts such as pipeline ruptures cannot be completely prevented, but would be cleaned up following an incident, as directed by the land management agency. The Wyoming Game & Fish Department has been involved during the preparation of the EIS and would remain involved as the project is developed. The Wyoming Game and Fish Department prepared the Fisheries Monitoring Plan contained in the final EIS and would review the data that is collected.

26.13 The text has been clarified. See Errata Summary for page 3-20 of the DEIS.

26.14 The Wyoming Game and Fish Department would be contacted prior to hydrostatic testing to avoid impacts to aquatic resources.

26.15 Thank you for your comment. Impacts to wildlife from the evaporation pond and alternative methods of disposal will be considered as part of the final decision making process. Please refer to Response to Comment 26.5.

26.16 As stated on Page 4-29 of the DEIS, spills into streams from a rupture of the molten sulfur or sour gas pipelines are not considered probable during the life of the project. Therefore, placing automatic shutoff valves at all river crossings containing a fishery does not seem to be justified. Discharge of sour gas into a stream would be toxic to aquatic life while molten sulfur would not be. In the event of a leak or rupture affecting a stream, the company would be required to rehabilitate the affected area as required by the land management agency.

26.17 It is agreed that plastic whirlers would not be completely effective in frightening birds away from the evaporation pond. Additional measures would be used as required by the Authorized Officer. Alternative methods of disposal such as reinjection wells would be considered by the Authorized Officer prior to the approval of a right-of-way.

26.18 Mitigation and reclamation practice on private land is at the descretion of the land owner. Close coordination with the Wyoming Game & Fish Department is required.

26.19 Thank you for your recommendations. Raptor surveys will be conducted in coordination with the Fish and Wildlife Service; however, they are not usually done by the companies.

26.20 Thank you for this clarification. The text has been modified to include these species (see Errata Summary for pages 3-17 and 4-30 of the DEIS). The biological assessment and biological opinion are discussed in Appendix E of the DEIS and in Response to Comment 28.28 in the final EIS.

Comment Letter 27

WYOMING
EXECUTIVE DEPARTMENT
CHEYENNE

ED HERSCHLER
GOVERNOR

July 18, 1983

Mrs. Janis VanWyhe
Bureau of Land Management
Division of EIS Services
555 Zang Street, First Floor East
Denver, CO 80228

Dear Mrs. VanWyhe:

The Draft Environmental Impact Statement for the Riley Ridge Natural Gas Project has been circulated for state agency review. Agency comments are enclosed for your consideration and use. Questions and concerns raised in these comments should be thoroughly analyzed and resolved during preparation of the final document. Additional mitigation measures may be required to address these concerns. Likewise, identified data gaps should be resolved so that the information necessary to design effective mitigation measures is available in a timely fashion.

The Riley Ridge project can be developed in an acceptable fashion if the project proponents and the pertinent federal, state, and local entities work together in an open, cooperative manner to resolve the issues that arise. The worst case impacts, as analyzed and described in the draft EIS, can be avoided, controlled, and mitigated through the concerted efforts of all involved. In particular, the project proponents should commit themselves to self-policing and regulating the activities of their employees and contractors. Moreover, they should consistently follow a policy of public disclosure of their development schedules and plans. They should also display a genuine sensitivity and responsiveness to state and local concerns.

The state's major concerns fall into four categories: socioeconomic; health and safety; wildlife; and the venting of CO_2. The project proponents must work closely with the Industrial Siting Administration and the affected local governments to resolve housing and public facility or service concerns created by the projected population influx. The cummulative health and safety aspects of all the existing and proposed sour gas developments in the region must also be effectively addressed by both minimizing potential exposure, and developing emergency evacuation and response plans. Construction design, location,

scheduling, and reclamation techniques which minimize wildlife impacts should be employed. Likewise, an environmental awareness program to inform employees and residents of the potential environmental effects of their recreational and work activities should be implemented. The question of CO_2 venting will require additional consideration due to its present and potential economic value and the Wyoming Oil and Gas Commission's duty to prevent waste.

State jurisdiction in these and other areas will be fully exercised to insure that our procedural, regulatory, and statutory requirements are met. The full cooperation of all involved will obviously make our job easier. Such cooperation will also enable us to avoid unnecessary delays. Additionally, it may be necessary to amend this EIS if the project is delayed by the proponents.

Thank you for the opportunity to review and comment on this document. Please keep me informed of the progress of this effort.

Yours sincerely,

Ed Hensleigh

EH/pct

Enclosure

THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

Game and Fish Department

CHEYENNE, WYOMING 82002

W. DONALD DEXTER
DIRECTOR

July 19, 1983

EIS 630/L2
BLM/USFS/Environmental
Research and Technology, Inc.,
EIS - Riley Ridge Natural Gas
Project - Sublette, Lincoln,
And Sweetwater Counties, Wyoming

Mr. Dick Hartman
State Planning Coordinator
2320 Capitol Avenue
Cheyenne, Wyoming 82002

Dear Mr. Hartman:

In response to your request per SIN 83-121, the following comments are furnished on the DEIS for forwarding to the Bureau of Land Management and other interested federal agencies. Our comments in the interest of fisheries resources are offered in order of pagination of the document. Those comments in the interest of terrestrial wildlife are arranged by the sections of the DEIS.

FISHERIES RESOURCES:

We feel this document fails to adequately address several critical fisheries and water quality issues which have the potential to be seriously impacted.

27.1 We recommend formal coordination with the Department during preparation of the FEIS. Coordination to date has been somewhat haphazard from our perspective, and timing has apparently precluded consideration of much of our previous input.

27.2 Page 3-20, paragraph 1, line 9 states that streams in the Beaver and Dry Piney Creek drainages become turbid during moderate and heavy runoff and occasionally stop flowing. This should be clarified as only portions go dry and this does not occur during moderate to heavy runoff.

27.3 Page 3-20, column 2, line 15. Beaver Creek has the only indigenous pure strain of Colorado River cutthroat trout in the oil field but transplants have been made into three other streams: Pine Grove Creek, Fogarty Creek and Black Canyon Creek. The other streams mentioned have

27.3 (cont.) varying degrees of stock purity, but we still feel they warrant protection.

27.4 Page 3-52, Table 3-28, delete "poor fishing" under Attractions/Use Restrictions heading for the Big Sandy State Recreation Area.

27.5 Page 4-17, significance criteria number 12 is inadequate. Effects of increased fishing pressure, both legal and illegal, is dependent upon the specific water impacted. An increase of 15 percent may be disastrous for small Colorado cutthroat trout fisheries but acceptable for large reservoirs. Also, determination of a 15 percent increase in illegal fishing would be virtually impossible since the number of illegal fishermen is unknown. Additional work is needed to define meaningful and measurable significance criteria for indirect impacts.

27.6 Fish mortality should be added as a separate significance criterion.

27.7 Page 4-24, paragraph 1, column 1, line 5 states that "Piney Grove Creek currently supports a hybrid Colorado River cutthroat trout fishery....". This statement is not correct as these are pure Colorado River cutthroat trout stocked by the Wyoming Game and Fish Department.

27.8 Page 4-24, paragraph 2, column 1 attributes a 1972 fish kill in Pine Grove Creek to salt water. This incident also involved oil from an existing well. Invertebrates were killed in addition to the fish.

27.9 Page 4-24, last paragraph, column 2, line 7 and 8, change to Dry Piney Creek tributaries. This paragraph, and the first on page 4-25, dwell on the ability of hatcheries to keep up with fishing pressure. Increased hatchery production is not a substitute for habitat maintenance and sound management. While the hatchery system does have a significant role in management, some management concepts and goals cannot be realized through increased hatchery production.

27.10 Page 4-26, paragraph 4, column 2 seems to relate significance to fish reproductive failure. We contend that significant fisheries impacts from pH suppression could result prior to reproductive failure.

27.11 Page 4-42, column 1 indicates that all facilities except Quasar's treatment plant at East Dry Basin comply with applicable Class II increments. We feel the Quasar plant should be required to apply appropriate technology to comply with air quality standards or reduce plant size to achieve compliance.

27.12 Page 4-46, paragraph 2, column 2, indicates that stream pH changes have not been explicity modeled and that "insufficient data exist to adequately assess potential pH changes. The precise data needs are itemized in the recommendations contained in Appendix E." Appendix E.2 -

27.12 (cont.) Additional Monitoring - states that the action plans for air quality, fisheries and surface water monitoring will be provided in the FEIS. We feel that it is improper to release the DEIS without resolving these monitoring needs. Our personnel have been working on a draft fisheries monitoring plan in conjunction with the USFS and BLM. We recommend that monitoring plans for air quality, fisheries and surface water be developed prior to release of the FEIS and that our Department be formally consulted and involved in their development. These monitoring needs exist solely because of energy development and the costs should be borne by the companies involved. Financial assistance to our department for fisheries monitoring may be necessary and should be discussed during plan development.

27.13 Page 4-48, paragraph 1, summarizes what would result in pages of comments and questions we have relative to acidic deposition. This paragraph states that "the long-term effects of acid deposition in the Bridger Wilderness Area cannot be estimated at this time with high confidence" and that "the long-term rate at whichalkalinity is replaced is poorly understood and requires substantial study."

We believe that potential hazards of acidic deposition were inadequately addressed in the DEIS. This subject should be fully addressed prior to project authorization. The fisheries and water resources involved are too important to take a gamble based on an "assumption" of no significant impact. Industries have a responsibility to work with state and federal agencies to find answers prior to development.

27.14 Page D-2, last 2 paragraphs in column 1 and first paragraph in column 2 list mitigation measures. We do not feel these to be mitigation measures at all. Instead, these are obligations for WGF in the event that mitigation is not realized. They represent further losses to the resource and public, who have already lost considerably if these conditions must be implemented. We recommend development of sound mitigation measures as those listed have nothing to do with mitigation, in our opinion.

27.15 Page 1-23. If it becomes necessary to construct temporary bridges or culverts across creeks and gullies on the working side of the right-of-way during pipelineconstruction, measures must be taken to insure integrity of the stream channel and protection of water quality. All fill used at crossings should be free of easily erodable fines and culverts should be sized to accommodate anticipated peak flows. Upon abandonment of the crossing, all fill should be removed from the channel, the grade and slope of the channel and banks returned to their original condition, and the banks and riparian areas stabilized and revegetated.

27.16 Page 3-29. The sulfur loadout facility, located 2 miles northeast of Opal, would be partially within the 100-year flood plain of the Ham's Fork River. Though it is true that flooding of the facility may not

27.16 (cont.) cause contamination of the river, it does create a potential hazard. It would also seem to be advantageous to the company to have the facility outside of the flood plain if at all possible.

27.17 Page 4-21. One of the main impacts identified in this section of the document is the deposition of sediment and the resultant decrease in spawning and food production areas. One of the main sources of the sediment would be from the forty-four pipeline crossings. To limit sediment input into the streams, precautions should be taken during trenching and backfilling operations. Operations of heavy equipment within the stream and on the banks should be kept to a minimum, spoil piles should be located outside the active channel, and backfilling should be done with clean fill if available and if the originally removed material contains easily suspended fines.

27.18 Page 4-104. The document states that if pipeline construction across the Green River occurred during the late fall, brown trout spawning migrations could be temporarily blocked. It further states that since this blockage would occur for only two weeks, spawning would not be significantly affected. We contend if it occurred during the peak of spawning, two weeks of preventing migration could very well represent a significant impact. We strongly recommend that no pipeline crossings, on the Green River or any other stream supporting a game fishery, be constructed during periods of trout spawning.

27.19 Page 4-134. In conjunction with Mitigation Measure WF-8, we recommend the following avoidance periods during the construction of linear facilities. Avoidance of stream crossings during these spawning periods would help to eliminate potential impacts.

Area	Period
Cutthroat and rainbow trout streams	April 15 - July 10
Brown and brook trout streams	September 1 - November 1

These are general guidelines only. Site specific information should be obtained from local Game and Fish Department biologists prior to construction.

27.20 Page B-3. Listed under the Applicant's Standard Operating Procedures is the technique of diverting creek flows around the construction area through the use of pumps and/or flumes. This would minimize downstream sedimentation but the following precautions must be considered:

1. Blockage, diversion, and pumping operations should be carried out so as not to cause a complete interruption of flow from which would cause absence of water in downstream reaches.

27.20 (cont.) 2. The stretch of river around which the water is to be diverted should be kept as short as possible to prevent stranding of fish and drying of invertebrate food sources.

27.21 Page E-4. The fisheries monitoring program, which is to be provided in the FEIS should be formulated in consultation with the Wyoming Game and Fish Department's Area Fisheries Supervisor in Pinedale.

TERRESTRIAL WILDLIFE:

Well Field

1. Few alternatives are presented for developing this well field. The use of directional drilling could minimize habitat loss in areas such as Snider Basin and Graphite Hollow. Certainly, the issue of minimizing the loss of critical elk habitat should be a major concern. It is the policy of this Department to oppose industrial development in critical wildlife habitat, unless adequate mitigation is proposed.

27.22 2. Another significant issue in the development of this field is that of the Finnegan Elk Feedground. Development of wells in this area may significantly reduce the use of this area by elk, and thus, affect our ability to achieve our objectives in the Piney Herd Unit. This problem should be discussed in the EIS.

27.23 3. The DEIS and technical reports adequately summarized other problems related to well field development. It should be noted, however, that the population estimate given for the Sublette Antelope Herd Unit is incorrect. A total of 25,588 antelope were observed in an aerial population trend count of this herd unit in May, 1983. This total does not reflect 1983 fawn production.

weetening Plants

1. A significant issue in the development of gas sweetening plants is that of mule deer critical winter range. As noted above, we oppose industrial development on critical winter range, unless adequately mitigated. The Shute Creek Alternative is the most preferred, and the Northern Alternative the least preferred in light of this issue.

Right-of-Ways and Transportation Components

1. We suggest that sulfur from the sweetening plants be moved to the railroad at Opal via pipeline. This would result in reduced habitat loss, and eliminate the potential for wildlife losses due to collision with trains on the proposed rail spur. Pipeline facilities shared by companies could significantly reduce cost and habitat loss.

2. Three alternative transmission line routes are proposed. We agree the BLM proposal is least damaging to wildlife habitat since it more closely follows existing right-of-ways.

3. The use of man camps, rather than housing employees in local communities is recommended. The use of man-camps will reduce the number of people setting up temporary residence on public land. Our experience in southwestern Wyoming indicate that wildlife impacts are reduced when employees are concentrated, and not living in areas with significant wildlife values.

Mitigation Measures

27.24 1. We are pleased to see realistic suggestions for mitigation listed in the DEIS. WF-1 is a reasonable measure, but should be only a part of a comprehensive environmental awareness program. WF-6 may be of limited effectiveness. In mitigation measure WF-11, pipeline crossing should be placed at narrow spots in the river, not at islands, in order to minimize impacts on riparian habitat.

27.25 2. Uncommitted mitigation measures are listed in Appendix D. The suggested closure or restriction of hunting seasons is inappropriate and unacceptable as mitigation. This should be deleted. An environmental awareness program is an excellent mitigation, and should be implemented prior to construction. Funding for additional wildlife law enforcement personnel is another excellent mitigatory measure. We believe that the impacts which will occur on existing wildlife law enforcement personnel should be mitigated in this manner.

Miscellaneous Comments

27.26 1. It should be noted on Page 3-17 that about 330 elk winter on the Finnegan Feedground.

27.27 2. We are concerned about the potential effects of the 30-acre evaporation pond from Northwest's plant at Craven Creek. If this pond is constructed, we recommend it be made completely inaccessible to wildlife.

Please contact this office or our District Office in Green River, or our fisheries office in Pinedale to arrange for further coordination and input by our Department.

Sincerely,

W. DONALD DEXTER
DIRECTOR
WYOMING GAME AND FISH DEPARTMENT

WDD:HBM:blh
cc: Game Division
Fish Division

THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

State Engineer's Office

BARRETT BUILDING CHEYENNE, WYOMING 82002

June 22, 1983

M E M O R A N D U M

TO: Dick Hartman, State Planning Coordinator

FROM: Louis E. Allen, Water Resources Engineer LEA

SUBJECT: State Identifier No. 83-121, Riley Ridge Natural Gas Project, Draft EIS, BLM.

I have examined the subject draft EIS, primarily for water supply implications, and offer the following comments:

27.28 1. There appears to be an error in the Summary, page vii, in the second paragraph of the Introduction. Processing 2.8 billion cfd of sour gas should yield more than 576 cfd of methane if the project is to be viable. Page 1-3 shows 580 million cfd of sales gas from the above sour gas volume. The reader is forced to assume throughout that all mentions of cfd of gas refer to the gas at some standard temperature and pressure, or scfd. Otherwise, there is no basis for comparisons. Definition of the standard used would be helpful.

27.29 2. The last paragraph beginning on page 1-1 implies that venting 1.876 cfd (scfd?) of CO_2 gas is a problem. I question this.

27.30 3. Pages 1-8, 9, Table 1-2, Wyoming State Engineer's Office. Except for the "Review of water supply and water yield analysis" required under the Industrial Siting Act, the Wyoming statute citations are in error. These other items need to be addressed in the process of satisfying W.S. 35-12-107, but they must be satisfied under other statutes in Title 41 prior to construction, whether or not a given project falls under the Industrial Siting Act.

27.31 4. We appreciate the recognition of the necessity for a permit from the State Engineer for hydrostatic test water, pages 1-24 and 4-27. Such a Temporary Use Permit would also apply to construction water. The exception would be if the water source was under permit as a facility water

27.31 (cont.) supply. Page 4-27 implies the source of test water might be existing irrigation water rights, in which case an agreement with the water right owner for such use must be filed long with the application for the Temporary Use Permit. Page 4-27 also says that this use should not affect the fishery resource. The legal concern is that the use not injure an existing water appropriator.

27.32 5. Page 1-40, Water Supply, refers to Table 1-21 for water requirements. From examination of page 1-58, the reference should be to Table 1-22. There is no mention of the necessity for State Engineer Permits for surface water and/or ground water supplies before construction begins. With regard to appropriation of water from the Green River for the life-of-project uses, a current date water right could be subject to regulation at times. The acquisition of storage water from Fontenelle Reservoir for a firm operation supply would be prudent. The discussions of ground water supplies seem to be somewhat vague and based largely on hope.

27.33 6. Page 1-53, Water Supply, refers to the Big Sandy Salinity Control Project and questions the availability of water from this source before 1989. I believe it would be possible to meet at least that portion of the requirements within practical delivery distances by 1986. The potential users would need to make prompt and firm commitments for the water to help push the Big Sandy effort along. The State would also need to know delivery points, and if there are limitations on the salinity concentrations and/or specific constituent ion concentrations that could make the Big Sandy water unacceptable. An option might be a short-term contract for Fontenelle Reservoir water until Big Sandy water was available.

27.34 7. Page 1-54, Table 1-19, lists an "Operation Water Requirement" for the Big Sandy Salinity Control Project of 25,000 ac-ft/yr. This is probably high for the yield of the proposed well field by about a factor of two. The next entry, for the proposed Chevron Phosphate Fertilizer Plant, also shows 25,000 ac-ft/yr. Chevron has contracted for 22,500 ac-ft/yr from Fontenelle Reservoir, which is expected to be in excess of actual requirements, and has agreed to accept Big Sandy water for a part of its supply when it becomes available.

27.35 8. Page 3-29, Plant Sites, Surface Water. The discussion refers to average discharges, and fails to recognize low flow periods. The fact that prior water rights may have a claim on all of the flow at times is completely ignored. Refer to Comment 5 regarding storage water.

27.36 9. Page 3-29, Linear Facilities, refers to a pipeline crossing the Big Sandy River. The maps in the map pockets show this crossing in the Big Bend area of the river, which is the area of the heaviest saline seeps to

27.36 (cont.) the river. The pipeline crossing, unless elevated, would very likely aggravate the saline seeps problem. I suggest the consideration of a crossing downstream at or below the Gasson Bridge. Coordination with the State and the USBR may be advantageous to all parties on right-of-way acquisition for a portion of the routing south and east of the Big Sandy River.

10. Since the proposed project will come under the Industrial Siting Act, we would expect the Water Supply and Water Yield Analysis required by W.S. 35-12-107 to clarify some of the points raised above and to be more specific regarding water sources and quantities. State Engineer Permits for water supplies, reservoirs, waste ponds, etc., should either be in hand or in the application and review stage at the time the Water Supply and Water Yield Analysis is submitted for review.

Thank you for the opportunity to review this draft EIS. Your referral memorandum is being returned as requested.

LEA/ht

cc: George L. Christopulos
State Engineer

Richard Stockdale
Ground Water Geologist

John Teichert
Superintendent, Water Div. No. 4

THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

WYOMING RECREATION COMMISSION

1920 THOMES CHEYENNE, WYOMING 82002

ALVIN F. BASTRON, P.E.
Director
777-7695

June 15, 1983

Mr. Dick Hartman
State Planning Coordinator
2320 Capitol Ave.
Cheyenne, WY 82002

RE: 83-121

Dear Mr. Hartman:

The Draft Environmental Impact Statement for the proposed Riley Ridge Natural Gas Project was received in this office June 6, 1983. Thank you for giving us the opportunity to review the report.

27.37 After reviewing the D.E.I.S., the WRC is in agreement with the identified Agency Preferred Alternative, i.e., the Shute Creek Alternative. However, the Commission is in disagreement with the statement made in the summary, Major Impact Conclusions, (Page ix). Specifically, the following statement is questionable, "The long term prospects, however, would be much more favorable and all affected groups, newcomers, long-term residents and temporary visitors should be able to enjoy the area's many recreation opportunities." The "should be able to enjoy" portion of that statement is very ambiguous and evasive and should be, at a minimum, qualified in the final report.

According to the report, regardless of which alternative is selected, the demand for recreation will increase by 27% (Chapter 2, pages 2-8, 2-9, 2-10 and 2-11). In Chapter 4, Environmental Consequences (page 4-64) the recreation summary contains the following statement, "Impacts to recreation due to the project would be significant and aggravated by cumulative development in the area." The 1980 Wyoming SCORP also identified "serious shortage of almost all recreation areas and facilities" in this area.

27.38 Recreation was not included as a mitigation measure within this report, (Chapter 4, page 4-131). Consequently, I find this D.I.E.S. confusing.

RICK KILMER, PRESIDENT, P.O. Box 51, Lusk 82225
CHARLES H. JOHNSON, VICE PRESIDENT, 108 W. Cedar, Rawlins 82301
E. LAWSON SCHWOPE, TREASURER, 900 Foyer Avenue, Cheyenne 82001
ALBERT PILCH, P.O. Box AF, Evanston 82930
DAN MADIA, 1017 Victoria, Sheridan 82801
MRS. ROBERT FRISBY, 2007 Newton Avenue, Cody 82414
FLOYD BARTLING, P.O. Box 172, Douglas 82633
JACK D. OSMOND, P.O. Box 216, Thayne 83127
LARRY BIRLEFFI, 929 E. Apache, Cheyenne 82009

27.38 (cont.) If "Impacts due to the project would be significant" why wasn't any mitigation measures proposed and why are the impacts down played in the summary?

27.39 The Recreation Commission would like to recommend that the uncommitted mitigation measures listed on page D-3 be adopted. Also, Fontenelle Reservoir could be playing a greater role in the provision of outdoor recreation opportunities, if there are no dam safety problems. Fontenelle Reservoir was all but over looked in the D.E.I.S. The private companies building the gas processing facilities could explore the following possibilities:

1. Provide additional funding and manpower to the Bureau of Reclamation in order to address some of the increased demand for recreation at Fontenelle.

2. Contract with a private firm for the operation and maintenance of the recreation facilities at the reservoir.

3. Discuss potential for operation and maintenance of the recreation facilities by Lincoln County at Fontenelle.

27.40 It is disturbing to note that the two responsible federal agencies for this report, the BLM and USFS, paid so little attention to potential recreation impacts. These two agencies should, at a minimum, provide a system for monitoring for identification of potential adverse impacts. If such impact should occur, they (BLM and USFS) should be ready to address the problems identified by providing for additional funding and manpower. This will assist in maintaining the exceptional recreation experiences currently available in the regions by reducing potential vandalism problems, user conflicts and resource damages.

Sincerely,

Joe Bonds

Joe Bonds
Planning Section Head

JB/jl

WYOMING RECREATION COMMISSION

STATE HISTORIC PRESERVATION OFFICE

REVIEW AND COMPLIANCE

Interdisciplinary Staff Comments

Archeology • History • Historical Architecture • Recreation Planning

TO: Mark Junge, Chief

FROM: Thomas E. Marceau, Review & Compliance Section Head TEM

DATE: June 20, 1983

RE: Riley Ridge Natural Gas Project Draft Environmental Impact Statement

27.41 Data presented on cultural resources within this DEIS indicate that the potential for site discovery in the project area is very high. Sampling inventories of 2.5% in the well field and less than 5% of the non-well field areas located hundreds of archeological and historic sites. On average, 50% of these resources have not been evaluated for inclusion in the National Register of Historic Places because of insufficient documentation. These sites will have to be relocated and properly evaluated. In addition to this re-evaluation, the State Historic Preservation Office agrees with and supports the requirement that 100% field surveys be conducted prior to construction on each area to be disturbed in order to determine all cultural resources present and the nature of potential impacts on these resources. Also, resoluation of problems posed by the presence of the 11 historic trails of national and regional significance must receive special consideration. We fully concur with the statement that "verification of their [historic trails] condition and proximity to related resources through terrestrial reconaissance will be necessary to determine their historical significance and to completely evaluated potential project impacts" (4-61).

THE STATE OF WYOMING

Ed Herschler, Governor
Leno Menghini, Superintendent and Chief Engineer

Wyoming State Highway Department

P. O. BOX 1708 CHEYENNE, WYOMING 82002-9019

June 30, 1983

Draft EIS Comments
Riley Ridge Natural Gas Project
ID 83-121

Mr. Dick Hartman
State Planning Coordinator
Wyoming State Clearinghouse
2320 Capitol Avenue
Cheyenne, WY 82002

Dear Mr. Hartman:

We have reviewed the Riley Ridge EIS and offer the following comments:

27.42 1. Separated crossings will have to be provided for any railroad spurs that cross State Highways.

27.43 2. On Page I-28 it is proposed that the sulfur pipeline cross two major highways underground, and cross all other highways above ground. This will have to be modified to make all State Highway crossings underground.

27.44 3. The significance criteria listed on Page 4-69 is that of the authors, and must not be construed to reflect either agreement or disagreement by the Wyoming State Highway Department. Of importance is the recognition that the project will severely impact the highways in the area.

27.45 4. The mitigation measures proposed are not adequate to mitigate the impacts to Highways US 189 and Wyoming 240. These are lightly traveled roads that largely serve local travel needs. Little work has been done on them other than minor repairs in the last 20 to 40 years. They are narrow, and do not meet current design standards. Structurally, they cannot be expected to withstand the anticipated traffic loads.

27.46 Reconstruction to appropriate standards will be necessary to correct operational and structural problems. Unless this is done, it is likely that stringent traffic and load restrictions will be necessary at critical periods.

27.47 We would anticipate that initially the urgent need would be to upgrade the intersections where heavy turning movements occur to safely and efficiently handle them.

Very truly yours,

William P. King

William P. King, P. E.
Environmental Services Engineer

WPK/mg

cc: A. V. DeBernardi

THE STATE OF WYOMING

EXECUTIVE DEPARTMENT

ED HERSCHLER
GOVERNOR

Office of Industrial Siting Administration

SUITE 500 BOYD BUILDING CHEYENNE, WYOMING 82002 TELEPHONE: 307-777-7368

July 1, 1983

Dick Hartman
State Planning Coordinator
Wyoming State Clearinghouse
2320 Capitol Avenue
Cheyenne, WY 82002

Re: Riley Ridge DEIS, SIN 83-121

Dear Dick:

The Industrial Siting Administration staff has the following comments regarding the Riley Ridge DEIS.

General

Chapters 1 and 2 of the Riley Ridge DEIS are generally comprehensive and well written. However, because of the magnitude of the project and the ensuing environmental implications, critical comments in many cases must be limited to general or superficial remarks. Specific locations of components and corridors will be required for a more detailed analysis of environmental concerns. Chapter 3 needs a more detailed appraisal of existing environmental conditions. Information in this section is either inadequate, missing, or not available in several cases. Where information is not available, an effort should be made to obtain it before construction commences. Because of inadequacies in Chapter 3, Chapter 4 suffers from a lack of quantitative and comparative environmental impact analyses. Impacts are thoroughly presented in qualitative fashion but because of the lack of quantitative impact analysis and because cumulative impacts, unavoidable adverse impacts and long-term environmental consequences are only briefly discussed, the document implicitly belittles the potential magnitude of environmental impact to the region.

More specific comments follow:

	Page	Section	Comment
27.48	1-13	Industrial Siting	The correct title of the siting act is: Wyoming Industrial Development Information and Siting Act.

Dick Hartman
Page 2
July 1, 1983

	Page	Section	Comment
27.49	1-13		The construction cost criterion of $88 million for ISA jurisdiction is incorrect. This figure is adjusted on a quarterly basis according to construction cost indices. The current figure of $92.3 million will be in effect until August 31, 1983.
27.50	1-13		Sentence 2 should be changed to: "Under proposed administrative guidelines to implement the Act, one or more ...." Sentence 3 should be changed to: "These guidelines are intended ...."
27.51	1-18	Table 1-6	Why does Exxon require wider rights-of-way for its gathering system, access road, and gas lines than the other companies?
27.52	1-27	Sulfur Pipeline	Nowhere in the DEIS is an explanation of the reasoning for an above-ground sulfur pipeline. Most readers would not be aware of the need for an above-ground vs. below-ground sulfur pipeline. Given the difficulty that Chevron has experienced in making its sulfur pipeline operational, the DEIS should identify potential technical problems in relation to feasibility of the proposed pipeline.
27.53	1-28	Transmission Lines	Corridor and centerline selection criteria for transmission lines (and all other linear facilities) should be identified.
27.54	1-35	Components-Well Sites	The chemical nature and amount of corrosion inhibitor to be used in wells should be described.
27.55	1-36		Quasar plans to bury power cables to well sites with its pipeline gathering system. To reduce visual impacts, why doesn't Exxon?

	Page	Section	Comment
27.56	1-36		What wastes will be produced during normal maintenance of well sites, in what quantities, and precisely how will they be disposed?
	1-36		Environmental impacts of William's maintenance base camp and office cannot be evaluated until its location and that of appurtenant components are described.
27.57	1-36		Electric power requirements to Northwest and modes of delivery should be described.
27.58	1-39	Sulfur Pipeline and Loadout Facility	Detailed contingency plans should be provided for the disposal of sulfur in the event it is not marketable. Included should be a site description, general construction plan and reclamation procedures for sulfur storage areas.
	3-1, 4-1	Socioeconomics	Due to substantial changes in project development plans, the ISA staff did not evaluate socioeconomic impacts of Riley Ridge. A comprehensive socioeconomic analysis of the Riley Ridge projects will be conducted by the State at the time of filing for an Industrial Siting Permit.
27.59	3-24	Fisheries	A description of ephemeral streams at or near the plant sites is important because of the possibility of suspended solid, etc., transport into other streams of more biological significance.
27.60	3-26	Water Resources	This section does not have an adequate description of existing surface and ground water quality.

Dick Hartman
Page 4
July 1, 1983

	Page	Section	Comment
27.61	3-62	Wildlife	The routing of a railroad spur through Seedskadee National Wildlife Refuge and the other wildlife habitat mentioned in this section would seem to preclude the possibility that this alternative to sulfur transport was carefully evaluated before inclusion as a viable option.
	3-69	Linear Facilities	Seedskadee Wildlife Refuge should be avoided by all linear facilities.
27.62	4-16	Wildlife Significance	Significance criteria should also be applied to nesting and breeding habitat and staging areas for waterfowl and other water birds.
27.63	4-17	Fisheries Significance Criteria #8	How is it determined if critical habitat is affected by increased sedimentation?
27.64		#8	Sedimentation can affect other aspects of fisheries besides critical habitat (e.g. gill abrasion, reduced primary productivity and other food sources, loss of visual acuity, etc.).
27.65		#9.	Other things besides loss of beaver ponds can lead to loss of important habitat. Changes in stream bank and channel morphology should be considered in significance criteria.
27.66	4-19	Wildlife	Effects should be quantified wherever possible, even if only in qualitative (e.g. small, large) terms.
27.67			The 17% reduction in elk habitat effectiveness is close enough to the 20% criterion that, given subjectiveness in the analysis and the lack of statistical validation, loss of habitat quality should not be dismissed as an insignificant impact as concluded at the end of the 2nd

Dick Hartman
Page 5
July 1, 1983

	Page	Section	Comment
27.67 (cont.)			paragraph. Furthermore, this conclusion is inconsistent with the second sentence in that paragraph which states that increased human access would greatly reduce quality of habitat.
27.68	4-21	Fisheries	Construction at stream crossings should always be timed to occur during low flow. That this would "generally" occur, as stated in this section, is not stringent enough. The conclusion that impacts from (construction) would be short-term, localized and insignificant, is not convincing. Map 4-1 shows a very large drainage area which will be affected by numerous stream crossings occurring over a 40-year period. Even with sediment control procedures, sediment input into streams is likely to be significant. Impacts can be expected not only from construction at stream crossings but from all surface disturbance. Furthermore, impacts will not be "localized" and "short-term". Effects of sedimentation can occur far downstream from the project area and the continuance of these effects over a 40-year period is certain to affect fish populations. The impact on fish has not been estimated. Instead, it is stated that an impact analysis is impossible at this time, that fish populations may or may not be affected. More baseline data is needed here and a better attempt at quantifying effects of sedimentation on fisheries should be made. This is one of the major environmental concerns associated with the project.
27.69	4-26	Construction Fisheries	There is a tendency here and in the rest of the document to focus only on stream sections in the immediate vicinity of construction and to ignore sections and tributaries further downstream.

Dick Hartman
Page 6
July 1, 1983

	Page	Section	Comment
27.70	4-26	Operation - Wildlife	The analysis of acid rain effects on high mountain lakes is a difficult task. However, inherent difficulties in this analysis are only exacerbated by the lack of site-specific meteorological baseline data. Chronic and cumulative impacts will be more important here than acute pH toxicity to fish. Although these effects are difficult to estimate, it should be stressed that they represent potentially serious problems to relatively pristine watersheds in nearby wilderness areas.
27.71	4-27	Abandonment - Fisheries	Even though perennial streams are not present at the plant sites, downstream fisheries and other aquatic resources may be affected by surface disturbances at these sites.
27.72	4-27	Fisheries	This section over-simplifies the effects of construction on fisheries and riparian habitat. It does not analyze effects quantitatively, ignores long-term effects, and does not consider cumulative effects of other development in the region and cumulative effects of all the components (i.e. roads, pipelines, transmission lines, etc.) of the Riley Ridge Project itself.
27.73	4-29	Cumulative Impacts	This section is inadequate. The Chevron Phosphate Project, Road Hollow and the Big Sandy Project are not the only other projects which should be considered. Furthermore, the impacts discussed are incomplete and not discussed in enough detail.
27.74	4-30	Summary - Wildlife	The statement that only a small number of whooping cranes sporadically use the area does not lead one to the

	Page	Section	Comment
27.74 (cont.)			conclusion that cranes would be able to adjust to other available habitat. The last paragraph in this section is inconsistent with what is stated elsewhere in this section (i.e. Population effects on big game are not expected to be significant).
27.75	4-30	Summary - Fisheries	This section is inconsistent. On the one hand, it is stated that stream deterioration is already occurring and will continue to occur resulting in possible loss or reduction of fisheries and, on the other hand, it is stated, as in other places throughout the document, that effects on streams will be short-term with no long-term detrimental effects.
	4-77	Component Alternatives	Before any final federal approval of linear facilities, the State should have the opportunity for detailed review since changes may occur as a result of this review. This occurred recently with the Chevron Phosphate Project water supply pipeline; that is, the State recommended a routing unaddressed in the DEIS. The Industrial Siting Administration will work closely with the BLM on this matter as it relates to the Riley Ridge Project.

Sincerely,

Richard C Moore

Richard C. Moore, P.E.
Director

RCM/TC/lh

DIRECTOR AND
STATE GEOLOGIST
GARY B. GLASS

SURVEY ADVISORY BOARD
D.L. BLACKSTONE, JR.
WILLIAM H.B. GRAVES
EDMUND L. (ROY) HEISEY
ROBERT S. HOUSTON
BAYARD D. REA

EX OFFICIO:
GOV. ED. HERSCHLER
DONALD L. VEAL
DONALD B. BASKO

EDITOR
DAVID COPELAND

50 Years of Service to Wyoming

THE GEOLOGICAL SURVEY OF WYOMING
UNIVERSITY OF WYOMING
BOX 3008, UNIVERSITY STATION
LARAMIE, WYOMING 82071

(307) 742-2054 (307) 721-3920 (307) 766-2286

DEPUTY DIRECTOR
AND STAFF GEOLOGIST
–MINERALS (HARD ROCK)
W. DAN HAUSEL

STAFF GEOLOGISTS
JAMES C. CASE
–ENVIRONMENTAL
RODNEY H. DE BRUIN
–STRATIGRAPHY
RAY E. HARRIS
–MINERALS (SOFT ROCK)
RICHARD W. JONES
–COAL
ALAN J. VER PLOEG
–PETROLEUM

LABORATORY TECHNICIAN
JAY T. ROBERTS

To: State Planning Coordinator
From: Gary B. Glass, State Geologist
James C. Case, Environmental Geologist
Subject: Riley Ridge Natural Gas Project DEIS
State Identifier Number: 83-121
Date: June 29, 1983

We submit the following comments on the draft Riley Ridge EIS. In particular, we have some serious concerns about the health and safety sections of the DEIS (see our discussion under Health and Safety).

Page X, 5th paragraph, right column

27.76 Although it is recognized that the agencies preparing this DEIS can prefer the venting of 1.876 billion cubic feet of CO_2 per day, the Wyoming Oil and Gas Conservation Commission has jurisdiction over the venting of natural gas in Wyoming (Wyoming Statutes 30-5-102 and 30-5-121, Table 1-2 on p. 1-9 of this DEIS). The Commission cannot make a decision on venting until after testimony and evidence are presented to them in a public hearing. The Commission, however, is tasked with the prevention of waste. Presently, this issue is not before the Commission.

Page 1-1

27.77 The last paragraph on the right column should read 1.876 billion cubic feet per day, not 1.876 cfd.

Page 4-30 to 4-34, Health and Safety

27.78 Having reviewed a draft of the report upon which blowout frequency estimates were apparently derived for this DEIS, we question how reliable these estimates are for the Riley Ridge area. For example, in that study the mean depth of the wells with uncontrolled releases was 4,464 feet in Texas and 3,582 feet in Alberta. The report also noted that the likelihood for blowouts increases with the depth of drilling. The Riley Ridge wells are more than 14,000 feet deep or 3 to 4 times the well depths in the study. High bottomhole pressures are also possible in the Riley Ridge area.

. . . . .

27.78 (cont.) Although Riley Ridge deep wells are equipped with special blowout preventers, the blowout frequency estimates should be based on a sampling of wells drilled in similar geologic settings, drilled to similar depths, and drilled with similar blowout preventive measures. Because this was not the case, there is no way to confirm the reliability of the blowout frequency estimates presented in this DEIS.

Unless the derivation of blowout frequency and pipeline rupture frequency are refined and documented, the safest course of action would be the Northern Alternative which apparently poses the least threat to human health and safety. Even the effects of this alternative are suspect with the data that are now available.

27.78 (cont.) Similarly, the frequency estimates for pipeline failures should be based on samplings from areas with similar topographic expression and with similar potential for geologic hazards, i.e., with similar landslide, subsidence, and seismic risks (subjects that are not discussed in this DEIS).

27.79 The DEIS seems to play down the real likelihood that the huge volumes of CO_2 in the Riley Ridge gas will prevent the ignition of gas in the event of a blowout. The study upon which the risk analysis was based noted that forecasted dispersion of blowout gas is quite different if it is ignited as there is a buoyant effect to hot burning gas. The DEIS mentions that raw stream gas must be on hand for the purpose of flaring during a blowout, but there is no discussion of how successful this mitigation measure might be.

27.80 It is also unclear if the risk analysis to communities in the area is based on ignition of blowouts of whether it is based on a worst case scenario where a blowout cannot be readily ignited.

There are really no references to studies on which various risks cited in this section were based. One illustration cites a report by Atwell and Andrews, 1979, and there is a reference to a personal communication with Layton, 1982. Considering the importance of these risk analyses, better documentation is needed. A report by Layton, which is in draft form, should be cited and reviewed before risk statements are published in any DEIS.

27.81 The DEIS does not provide any risk assessment for the sour gas processing plants themselves. There must be some potential for H_2S release within these plants.

27.82 The DEIS dos not address the need to restrict new or temporary housing near the wells, gathering lines, trunk lines, and sour gas plants, particularly in downwind locations. Some temporary zoning or building restrictions are needed to prevent unwary or uninformed persons from building in close proximity to any of the sour gas facilities.

General

27.83 The Road Hollow Gas Plant and Cave Creek Sour Gas Gathering System are not shown on Map 3-5 or any other map in the DEIS related to proposed facilities. Although these facilities may not directly affect the health and safety aspect of the Riley Ridge project, they would have some bearing on socioeconomic, wildlife, air quality, etc. aspects of the area.

27.84 Also, the regional health and safety aspects of all this sour gas development in southwestern Wyoming has apparently been overlooked, particularly from a disaster and emergency preparedness standpoint. Because projects are occurring or are planned in several counties, is anyone coordinating regional concerns and plans? Some agency or organization should at least evaluate the cumulative impact of all sour gas development in southwestern Wyoming, and decide if there is a need for more than site specific disaster preparedness plans.

JUN 20 1983

CHAIRMAN
GOVERNOR ED HERSCHLER

COMMISSIONERS
OSCAR E. SWAN
BERN WHITTAKER
RICHARD S. CROSS
[redacted]
GARY B. GLASS

The State of Wyoming

OFFICE OF
OIL AND GAS CONSERVATION COMMISSION
STATE OIL AND GAS SUPERVISOR
123 SOUTH DURBIN
P. O. BOX 2640
CASPER
82602

STATE OIL AND GAS SUPERVISOR
DONALD B. BASKO

EX OFFICIO DIRECTOR OF
OIL AND GAS CONSERVATION

June 17, 1983

Dick Hartman
State Planning Coordinator's Office
Wyoming State Clearing House
2320 Capitol Avenue
Cheyenne, WY 82002

Re: The Riley Ridge Natural Gas Project,
Draft EIS Number 83-121

Dear Mr. Hartman:

In reply to your memorandum of May 31, 1983 regarding the Riley Ridge natural gas project EIS, this is to advise that I commented on this extensively in my letter of December 27, 1982. I note that at least some of the recommendations and suggestions were adopted into the statement.

27.85 Apparently, the Bureau of Land Management and the companies involved still are under the impression that the State will approve the venting of approximately 70% of the gas stream from gas wells because its CO_2 is non-combustible. I again point out that CO_2 has value in tertiary floods as well as other industrial uses, and it should not be wasted.

It is my opinion that the Wyoming Oil and Gas Conservation Commission would feel that same way about this extensive natural resource. In addition, I feel that consideration should also be given to the development of industrial parks when these fields begin to be developed so as to minimize the unregulated development of businesses associated with oil and gas operations. I would also hate to see the Bureau of Land Management adopt any policies or regulations which would prevent oil and gas activity in this area, but feel that the impact created by such massive projects must be mitigated as much as possible.

Very truly yours,

Donald B. Basko

DBB:wal

Donald B. Basko,
State Oil and Gas Supervisor

Comments by Public Service Commission

COMMENTS ON RILEY RIDGE E.I.S.

27.86 1- On Page 1-7, under D.O.T., add Part 191 & 192

27.87 2- On Page 1-10, under Public Service Commission, Add Title 49, CFR Parts 191 & 192 & 195 of the D.O.T. Regulations for plants and pipelines

27.88 3- On Page 1-14, Add- Safety Requirements
The Wyoming Public Service in addition to having jurisdiction of intra state pipelines and facilities, also act as agents for the federal D.O.T. Particular emphasis is placed on welding and construction from both quality and safety viewpoints. Coordination and instruction meetings should be planned well in advance of construction in order that all requirements are understood. This can help avoid costly problems and lost time after construction has begun, if requirements have not been met. The contact for preconstruction planning is A.J. Schellenberg (307)777-7427. Mailing address is 320 West 25th Street, Cheyenne, Wyoming 82002, Attention A.J. Schellenberg.

NONE OTHER THAN ABOVE (CONCUR) GAV

Responses to Comment Letter 27

27.1 Coordination with Wyoming Game and Fish Department will continue during the preparation of the final EIS. During the preparation of the DEIS, there was considerable contact with the Wyoming Game and Fish Department Pinedale District fisheries biologists (especially Ron Remmick and Glen Dunning). ERT spent one week in August 1982 meeting with Ron and Glen who provided data and a tour of the important streams in the study area. ERT contacted Ron Remmick over two dozen times during the course of the EIS preparation for clarification of data, new data needs, fish distribution questions, etc. Ron Remmick also participated in the preparation of the fisheries monitoring plan which is part of this final EIS.

ERT fisheries biologist Bob Martinson met with John Baughman in Cheyenne for initial data needs and phone calls were placed to Mike Stone. ERT sent another fisheries biologist to the HQI workshop held in Jackson, Wyoming (late August 1982) prior to his performing HQI analysis on selected streams in the study area.

27.2 Text has been clarified. See Errata Summary for page 3-20 of the DEIS.

27.3 Text has been clarified. See Errata Summary for page 3-20 of the DEIS.

27.4 The table has been modified. See Errata Summary for Table 3-28 on page 3-52 of the DEIS.

27.5 This is without a doubt, the most difficult area to come up with meaningful significance criteria. We agree that the significance of a 15 percent increase in illegal fishing pressure would vary for streams versus reservoirs. However, small trout streams in the well field are the resource most likely to be impacted by the Riley Ridge Natural Gas Project. In using a 15 percent increase as a significance criteria we assumed that a 15 percent increase in population (which can be predicted) would result in a 15 percent increase in illegal hunting and fishing pressure. In other words, a one-to-one relationship exists between increased population and increased hunting and fishing. At present, no research data have been established regarding significant increases in these secondary impacts related to energy development. Therefore, the 15 percent figure was based on mutual consensus with Wyoming Game and Fish, FS, and BLM biologists.

27.6 Direct mortality of fish related to accidental spills of toxic chemicals was included as a significance criteria (page 4-16 of the DEIS). Indirect mortality, that may result from sedimentation or loss of critical habitat is also addressed beginning on page 4-20 of the DEIS. To our knowledge, there are no figures on current fish mortality in affected streams, and no research to support that a certain increase in mortality is considered significant, or methods available to separate natural cause and effect relationships from those related to well field development.

27.7 The text has been corrected. See Errata Summary for page 4-24 of the DEIS.

27.8 Text has been clarified. See Errata Summary for page 4-24 of the DEIS.

27.9 The intent of this discussion is to point out the potential impacts on the fish populations that increased fishing pressure may have. If natural recruitment (currently the desirable management goal of the Wyoming Game and Fish Department) does not keep pace with increased harvest, then increased reliance on stocking to maintain the resource seems to be a necessary alternative. Other options would include more regulation or closure of the streams to fishing. See Errata Summary for text change on page 4-24 of the DEIS.

27.10 Effects of pH suppression on the aquatic habitat are briefly discussed in the following paragraph on page 4-26 for the DEIS. It could be added that elements of the fishes food base (phytoplankton/zooplankton/benthos) can be affected by pH suppression, thus affecting fish populations indirectly.

27.11 All gas treatment plants, including American Quasar's, would be required to comply with all applicable air quality standards. Please refer to Mitigation Measure AQ-2 on page 4-135 of the DEIS for a discussion of Quasar's compliance with PSD Class II standards.

27.12 Monitoring plans for air quality, fisheries, and surface water are included as part of the final EIS. The fisheries plan was developed by the Wyoming Game and Fish Department. Funding for monitoring work will be negotiated between the applicants and the state and federal agencies involved.

27.13 The long-term effects of acid deposition were addressed to the extent possible. The air quality related values action plan contained in this final EIS is designed to gather the information necessary to assess potential impacts with a greater degree of confidence. The discussion of the effects of acid deposition on air quality related values has been modified as shown in the Errata Summary for page 4-48 of the DEIS. Significant impacts to water quality are predicted.

27.14 We agree that these measures (listed under Uncommitted Mitigation Measures in the DEIS) are management alternatives to dealing with potential impacts related to abuse of current regulations. They would not minimize impacts to the quality of recreational fishing or loss of the resource. However, they could minimize impacts in the future and protect the North Beaver Creek fishery. Wyoming Game and Fish, BLM, and FS biologists were consulted in preparing these measures. Other committed mitigation measures are listed in Chapter 4 of the DEIS. See especially page 4-133 of the DEIS, WF-10, WF-11, WF-12, WF-14, and Appendix B.7. A fisheries monitoring plan designed by Wyoming Game and Fish is also included in the final EIS.

27.15 Protective measures which address these concerns are included in Appendix B of the DEIS under Applicants' Standard Operating Procedures; General Measures; and Erosion Control, Revegetation, and Restoration Guidelines. Specific details of stream crossing construction must be included in the Construction and Use Plan submitted to, and approved by, the Authorized Officer.

27.16 Please refer to Comment 23.8 from Exxon for clarification of the location of the sulfur loadout.

27.17 These are all good suggestions to limit sediment yield to streams. Please refer to the committed mitigation measures beginning on page 4-131 of the DEIS and Appendix B of the DEIS for additional detail on construction techniques which will protect water quality and fisheries.

27.18 Construction of pipelines across the Green River in Seedskadee National Wildlife Refuge (discussed on page 4-104 of the DEIS) would take place under the direction of the U.S. Fish & Wildlife Service (FWS) as discussed in mitigation measure WF-4 on page 4-132 of the DEIS. Any seasonal restrictions would be determined by FWS.

27.19 Thank you for the information. This will be considered and incorporated into the Construction and Use Plan and final right-of-way grants.

27.20 Thank you, your comments will be incorporated in the preparation of the Construction and Use Plan.

27.21 The monitoring program will call for a joint effort between the Wyoming Game and Fish Deparment, BLM, and FS. The Pinedale office, as well as the Cheyenne office of the Wyoming Game and Fish Department will participate.

27.22 This potential impact was considered in detail including discussions with Wyoming Game and Fish biologist Bruce Johnson and Wyoming Game and Fish Warden Chuck Thornton. There was some initial concern about proposed well field roads and their proximity to Finnegan Feedground, but these issues were resolved (through road relocation) by discussion between Wyoming Game and Fish and industry. Impacts causing a reduction in feedground use are not anticipated.

27.23 Only published information was used in reporting population estimates for all species of big game. The 13,500 pronghorn reported for the Sublette Antelope Herd was the 1981 post-season population figure provided by Wyoming Game and Fish. More current data was unavailable at the time of analysis.

27.24 Your comments will be considered in the final decision making process. The requirement of crossing at an island has been eliminated. See Errata Summary for revision to page 4-133 in the DEIS.

27.25 Closure or restriction of hunting is certainly a last resort type of mitigation, but could be used if the Wyoming Game and Fish Department felt it was absolutely necessary. The other measures mentioned can be required by the Industrial Siting Administration in their application review.

27.26 Page 3-17 of the DEIS states that approximately 400 elk are fed on the Finnegan Feedground. This number was provided by Bruce Johnson, Wyoming Game and Fish Department Biologist in Big Piney.

27.27 Mitigation measures for the evaporation pond are discussed on page 4-132 of the DEIS and in Response to Comment 22.8. It may not be possible to make the pond completely inaccessible to wildlife.

27.28 Please see of the Summary (Section 1) in the FEIS.

27.29 Please see the correct figure in the Summary (Section 1) of this FEIS.

27.30 Thank you for the clarification. See Errata Summary for revisions to Table 1-2, pages 1-8 and 1-9 of the DEIS.

27.31 Thank you for your comment. This information will be useful during permit acquisition.

27.32 See Errata Summary for revision on page 1-40 of the DEIS.

Examining water rights for each of the applicants is not within the scope of the DEIS. Water requirements for the project were supplied by the applicants. Information on groundwater supply is very limited, and if the applicants must obtain water from other sources, acquisition of that water must be permitted under the existing statutes within the State of Wyoming. Any new facilities affecting federal lands not covered in the final EIS would be subject to separate analysis under NEPA.

27.33 Since the Big Sandy Salinity Control Project is an uncertain source of water in terms of delivery schedule and supply volume, the applicants would not commit to the use of Big Sandy water for the Riley Ridge Project.

27.34 Thank you for the clarification. Discussion with the Bureau of Reclamation in late 1982 indicated that the State of Wyoming was responsible for identifying markets for the water from the Big Sandy Salinity Control Project and that water yield from the project and its development schedule would likely change as water use is contracted. See Errata Summary for page 1-54 of the DEIS for changes.

27.35 A discussion of the effects of the water needs of the Craven Creek plant on the Green River during low flow periods can be found on page 4-37 of the DEIS. Effects on water quantity, water quality, or existing water rights are not expected.

27.36 Thank you for your comment. The State Engineer and Bureau of Reclamation will be consulted during the final review and approval of the pipeline right-of-ways that would cross the Big Sandy River.

27.37 See Summary in the FEIS for revision.

27.38 Recreation is closely tied to the Wildlife/Fisheries analysis in the DEIS in that hunting and fishing are important recreational resources in the Riley Ridge study area. The mitigation measures for wildlife and fisheries are, therefore, also applicable to recreation. The uncommitted mitigation measures in Appendix D of the DEIS also address recreation.

In the Summary (page ix of the DEIS), the significant impacts to recreation are identified as being short term (1985 and 1986). The long-term impacts (to recreation resources) would not be significant.

27.39 Thank you for your comments. They will be considered in the final decision making process. These items will be considered further by ISA in their permitting actions.

27.40 See Response to Comment 9.1.

27.41 Thank you for your comment.

27.42 Railroad spurs would comply with all requirements of the State Highway Department.

27.43 The sulfur pipeline will comply with all requirements of the State Highway Department.

27.44 Thank you for your comment on the transportation significance criteria.

27.45 The mitigation measures presented in the DEIS are as extensive as the BLM can require of the applicants. The Wyoming Industrial Siting Administration may require additional measures to mitigate impacts to transportation as part of the ISA permit process.

27.46 Please refer to Response to Comment 27.45.

27.47 Please refer to Response to Comment 27.45.

27.48 Revision made. See Errata Summary for page 1-13 of the DEIS.

27.49 See Errata Summary for page 1-13 of the DEIS.

27.50 Comment noted. See Errata Summary for page 1-13 of the DEIS.

27.51 The right-of-way widths analyzed in the DEIS are those submitted by the applicants. Differences in right-of-way width reflect differences in standard construction techniques and operating procedures utilized by the applicants.

27.52 The sulfur pipeline was analyzed in the DEIS as it was described in Exxon's and Quasar's right-of-way applications. The design for the pipeline was based on engineering considerations developed by the applicants. The reason the pipeline would be above-ground is to facilitate operation and maintenance of the pipeline. This is described on page 1-30 of the DEIS. Technical feasibility is generally not analyzed in an EIS when it does not affect potential impacts. Operational problems which could require draining the sulfur pipeline have been considered on page 4-54 of the DEIS.

Other operational problems which would be internal to the system and would not affect the environment have not been considered.

27.53 Please refer to Response to Comment 25.2.

27.54 The specific corrision inhibitor and the volume needed per well have not been established by Quasar at this time.

27.55 Exxon has not proposed to bury electrical distribution lines primarily due to economic considerations. Please refer to Response to Comment 23.44 for a more detailed discussion.

27.56 Routine maintenance of well sites would not generate wastes. Any trash which is produced from repair activities would be trucked from the site and disposed of in an approved landfill.

27.57 Northwest's exact power requirements for the well field have not been determined at this time. Power would be delivered to the well sites by expanding the existing power network, as described on page 1-36 of the DEIS.

27.58 Because of the value of elemental sulfur, it is the applicants' intention to develop markets for the sulfur by-product. Thus, a detailed contingency plan of the type described was not deemed necessary. Temporary interruptions in the sulfur market have been considered as discussed on page 1-39 of the DEIS.

27.59 Due to the distance of the Craven Creek and Shute Creek plant sites from any perennial streams containing a game fishery, erosion into ephemeral streams crossing these plant sites was not considered a significant impact. Thus, a detailed description of these ephemeral streams was not necessary.

27.60 Surface and groundwater quality data was collected by ERT during 1983 to provide baseline information. Upon completion of this program, the data will be provided to the BLM, FS, and applicants.

27.61 It is still felt that a railroad spur to the Big Piney area is a viable option. Potential conflicts with the Seedskadee National Wildlife Refuge have been dealt with in Mitigation Measure L-1 on page 4-138 of the DEIS. This measure will require the location of the railroad outside of the refuge.

27.62 Potential impact to nesting and breeding habitat and staging areas for waterfowl and other water birds was not identified as an issue during the scoping process. Also, these habitats have not been mapped in the Riley Ridge area, so there was no basis for quantification. Very little impact to waterfowl habitat would occur as a result of the project.

27.63 This impact could only be determined through a monitoring program that would include increased spawning bed sedimentation and/or decreased natural recruitment.

27.64 These sedimentation effects are covered on page 2-3 in the Wildlife and Fisheries Technical Report.

27.65 Both BLM and Wyoming Game and Fish Department fisheries biologists emphasized the importance of beaver ponds to the continued existence of the trout in the area, hence the emphasis was placed here. It is agreed that changes in stream bank morphology, especially if they result in loss of overwintering pools, would be considered a significant impact. This impact could not be predicted or quantitatively assessed for the EIS. However, this impact would be monitored using HQI and FS stream transect methodologies. (See the Fisheries Monitoring Program in this final EIS and also the methodology sections of the Wildlife and Fisheries Technical Report.)

27.66 Impacts were quantified throughout the EIS whenever possible.

27.67 A reduction in elk habitat effectiveness of 20 percent was determined early in the EIS process to be the level at which significant impacts would be considered to occur. This figure was developed in consultation with Wyoming Game and Fish and FS biologists. Although 17 percent is close, it is under 20 percent and therefore, by definition, not a significant impact. However, reduction of habitat quality is by no means dismissed. Please review the Wildlife and Fisheries Technical Report for detailed consideration of this impact.

27.68 As stated on pages 4-20 and 4-21 in the DEIS and in the Wildlife and Fisheries Technical Report, sedimentation is one of the major fisheries concerns associated with the Riley Ridge Project. It is also stated that due to the lack of detailed baseline information, it is not possible to quantify impacts to fish and fish habitat. It is agreed that additional baseline data is needed, and this will be collected as part of the fisheries monitoring program presented in this FEIS. The timing for the construction of roads and pipelines across streams would be approved by the Authorized Officer; however, except for the Green River (see Mitigation Measure WF-11 on page 4-133 of the DEIS), it can not be categorically stated that crossings will always occur during low flow period. The long-term effects of sedimentation are discussed on page 4-30 of the DEIS.

27.69 See Errata Summary for page 4-28 of the DEIS for clarifying information.

27.70 It is agreed that the long-term effects of acid deposition on high mountain lakes could be a serious problem that should be investigated further and monitored as the Riley Ridge Project progresses. Please refer to the Air Quality Related Values Action plan that is included in this final EIS.

27.71 Impact analysis was based on the assumption that sedimentation/siltation control measures would be used during the construction, operation, and abandonment phases of the project. For example, runoff water from exposed plant site surfaces would not be allowed to reach perennial streams because of the use of holding ponds, straw bales, etc. Thus, significant impacts to perennial streams from plant site abandonment are not anticipated.

27.72 1) This section deals only with linear facilities (pipelines and transmission lines). See Response to Comment 27.69 which discussed downstream cummulative effects of all stream crossings.

2) Effects of the project such as losses in spawning habitat, increases in pool siltation rates, fish population reductions and others, cannot be quantitatively analyzed because of insufficient baseline data and inadequate detail regarding project activities (estimated flow reductions, sediment input to streams, etc.).

3) Long-term effects are discussed in the summary on page 4-30 of the DEIS.

4) Cumulative effects are covered on page 4-29 of the DEIS.

5) Cumulative project-specific effects are discussed in the summary. The DEIS states in the summary section that considering all potential direct and indirect effects of the project on the existing fishery resource, the potential exists for its future value to be significantly reduced.

27.73 The comment fails to provide specific examples of deficiencies in the cumulative impact analysis. The Wyoming State Planning Coordinators Officer reviewed the list of interrelated projects on August 23, 1982, and made suggested changes. These changes were incorporated into the final list of interrelated projects before impact analysis was conducted.

27.74 The statement that cranes would be able to adjust to other available habitat is not based on their sporadic use of the area. It is based on the small amount of crane habitat lost when compared to available habitat. *Peregrine falcons* would not be expected to be impacted because of their sporadic use of the area and wide ranging habits. The commenter has also misinterpreted the summary. Impacts on big game *are* expected to be significant for elk, mule deer, pronghorn, and moose based on the significance criteria. Only wild horses and bighorn sheep would not experience significant impacts.

27.75 The commenter appears to have misunderstood the section. The cumulative effects of all project components (well pads, stream crossings, plant sites, pipeline rupture, increased indirect impacts, etc.) are addressed in this summary section. Taken individually, a pipeline crossing may disturb a stream for a short period of time if performed according to stipulated operation procedures. Impact analyses had to be based on the assumptions that operation procedures would be in accordance with various government stipulations. However, it is likely that some stipulated measures may be violated or not entirely successful. Hence, some long-term impacts may result from the incremental effects of several project components.

27.76 It is recognized that the State of Wyoming has concurrent authority over the flaring and/or venting of CO_2 It is the responsibility of the proponents to request a hearing before Wyoming Oil and Gas Conservation Commission (WOGCC) on this issue. The federal jurisdictional agencies intend to work closely with the WOGCC to reach decisions on the disposition of the CO_2 gas from the Riley Ridge Project.

27.77 Revision made per Response to Comment 21.11. See Errata Summary for page 1-1 of the DEIS.

27.78 Well blowout probabilities are based on historical data involving sour gas well blowouts. No specific data sources are known regarding onshore wells drilled to 10,000 feet plus. Neither are such data sources referenced by the commenter. Off-shore wells, however, are frequently drilled to deeper depths. Blowout probabilities from these data are estimated to be 1 blowout per 1,300 wells drilled. This is the same order of magnitude as the 1 per 630 wells probability used in the EIS. Lacking scientific data to the contrary, it is felt that the blowout probabilities as stated are representative of the Riley Ridge area.

Pipeline failure statistics are not broken down by the type of geologic area traversed by the pipeline. Since the sour gas trunk lines would traverse areas of low to moderate seismic activity (as discussed on page 1-4 of the Health and Safety Technical Report) nation-wide failure data (which include failures from earth movement) was deemed appropriate for use in the Riley Ridge rupture analysis. These data may tend to overestimate or underestimate the sources of failure for the Riley Ridge area, but in total, it was felt that they gave an accurate picture of the order of magnitude of pipeline failures that could be expected.

27.79 It is uncertain at this time whether or not it would be possible to flare the sour gas in the event of a blowout. (See Exxon's Comment 23.25 for more detail.) This would be partly dependent on the final gas composition of production wells. This composition would likely vary from well to well. Due to the uncertainty of the success of flaring, flaring has *not* been included as a mitigation measure in the DEIS.

27.80 The risk analysis for well blowouts was conducted using worst-case assumptions, i.e., escaping sour gas would not be ignited.

27.81 As mentioned on page 4-31 of the DEIS, the potential for the release of sour gas within the gas treatment plants would be less than from a pipeline rupture. Additionally, public access to the plant sites would be restricted. The worst-case risk to public safety at a gas treatment plant, i.e., a sour gas trunk line rupture at a plant boundary, has been analyzed.

27.82 On page 4-33 of the DEIS, the risks associated with an accidental release of sour gas are summarized. Specifically, lethal doses could be experienced within 0.5 mile of a well, within 3 miles of a trunk line, and within 4 miles of a gathering pipeline. Using these modeling results and the final configuration of wells and pipelines, planning boards can identify areas where restriction of residential development would be appropriate. Resulting restrictions and zoning changes are then the responsibility of individual planning boards.

27.83 The Road Hollow Gas Treatment Plant is shown on Map 1-8 in the DEIS and is included as an interrelated project. The Cave Creek Project was not included as an interrelated project because its impacts would not interact with the impacts from the Riley Ridge Project in a cumulative fashion.

27.84 The purpose of the Riley Ridge EIS was to examine the impacts of a specific set of proposals and any foreseeable future action which may create cumulative impacts. Only those projects which would have overlapping impacts in time or space were considered, therefore, all projects in southwest Wyoming were not considered.

The point raised by the commentor is valid and would appear to fall within the realm of state concerns and jurisdiction.

27.85 Refer to Comment 27.76. The federal agencies also have a responsibility to conservation and the prevention of waste. The potential uses of CO_2 have been recognized and are being considered in the decision making process.

27.86 The change has been made. See Errata Summary for Table 1-1 on page 1-7 of the DEIS.

27.87 The change has been made. See Errata Summary for page 1-10 of the DEIS.

27.88 Thank you for your comment. The Wyoming Public Service Commission will be contacted by the applicants or their contractors prior to beginning pipeline construction.

Comment Letter 28

ENVIRONMENTAL DEFENSE FUND

July 18, 1983

Byron Shark
Bureau of Land Management
Division of EIS Services
555 Zang St., 1st Floor East
Denver, CO 80228

Dear Mr. Shark:

Enclosed, please find a copy of our comments on the Draft Environmental Impact Statement for the Riley Ridge Natural Gas Project.

Please send a copy of the final EIS as well as any related decisions you might make to:

Craig Curcio
Environmental Defense Fund
1405 Arapahoe Ave.
Boulder, CO 80302

Thank you very much for your time and effort in this matter.

Sincerely,

Robert E. Yuhnke
Regional Counsel

REY:ob
Enclosure

1405 Arapahoe Avenue Boulder, Colorado 80302 ☎ 303-440-4901
OFFICES IN: NEW YORK, NY (NATIONAL HEADQUARTERS), WASHINGTON, DC; BERKELEY, CA; DENVER, CO

COMMENTS

FROM

ENVIRONMENTAL DEFENSE FUND

ON THE

DRAFT ENVIRONMENTAL IMPACT

STATEMENT

FOR

RILEY RIDGE NATURAL GAS PROJECT

Submitted by:

Robert E. Yuhnke
Regional Counsel

Craig C. Curcio
Legal Intern

July 19, 1983

TABLE OF CONTENTS

1. Introduction

2. Executive Summary

3. Identification and Analysis of Alternatives

3.1 The DEIS fails to give an adequate analysis of the purpose and need of the proposed action.

3.2 There is a lack of discussion on alternative energy measures such as conservation.

3.3 The DEIS fails to consider or analyze alternative control technologies.

3.4 The DEIS is deficient in its study of the existing environment.

3.5 Mitigation measures in the DEIS are insufficiently described and in some cases non-existent.

3.6 The No Action Alternative is deficient because it fails to discuss existing air quality as a comparison for the proposed project.

4. Air Quality Analysis

4.1 In some respects the cumulative impact study for Riley Ridge is deficient.

4.1.1 The Riley Ridge project DEIS considers some, but not all of the possible cumulative impacts.

4.1.2 The Riley Ridge DEIS fails to consider cumulative impacts from its predicted well blowouts.

4.1.3. The DEIS dismisses cumulative impacts on the Popo Agie and Fitzpatrick Primitive Areas.

4.2 There is a deficiency in analyzing visibility impacts on Class II areas.

4.3 Acid Deposition studies in the DEIS were deficient.

4.3.1 The DEIS fails to present essential data.

4.3.2 The report fails to compare increased depositin with background deposition.

4.3.3 Acid deposition studies of sensitive species is deficient.

4.4 There is no discussion of the potential for the impact of hazardous pollutants.

5. The Worst Case Model is Deficient.

5.1 Some assumptions are not accurate and lack rationalization through scientific means.

5.2 Worst Case modeling data are insufficient for proper analysis.

6. Scientific Integrity Standards Are Violated.

6.1 There is an inadequate explanation of the Wind Rose figures in the DEIS.

6.2 Use of some terms in the DEIS is misleading.

6.3 The DEIS fails to justify some of its conclusions.

1. Introduction.

The following comments are filed on the Draft Environmental Impact Statement for the Riley Ridge Natural Gas Project (Riley Ridge DEIS) on behalf of the Environmental Defense Fund (EDF) and its members. EDF is a charitable, non-profit, public membership organization. It is composed of scientists, lawyers, economists, educators, and other concerned citizens dedicated to the protection and enhancement of human health and the environment through research, education judicial, legislative, and administrative means. Organized under the laws of the state of New York, EDF maintains regional offices in Boulder, Colorado, Washington , D.C., and Berkeley, California. EDF has 47,300 active members nationwide, of whom more than 1000 reside in the Wyoming-Utah-Colorado region.

The Riley Ridge DEIS fails to meet the standards required by statute and regulation. The National Environmental Policy Act (NEPA) requires that the EIS provide information that is "useful in restoring, maintaining, and enhancing the quality of the environment." 42 U.S.C. Section 4332(G). In some instances, this EIS violates the usefulness requirement of the act.

Federal regulations governing the preparation of EIS's require that the statement "provide full and fair discussion of the significant environmental impacts." 40 C.F.R. Section 1502.1. Because of its failure to discuss several significant impacts, such as: 1) the failure to consider or analyze alternative control technologies, 2) the failure to assess a broad cumulative impact study, 3) the failure to study the impact of emissions

from predicted well blowouts, 4) deficiencies in analysis on the acid deposition problem, and 5) the failure to study impacts in the Popo Agie and Fitzpatrick primitive areas, this EIS cannot be considered a full discussion of significant impacts.

The regulations specify the criterion by which the sufficiency of the discussion of the affected environment is to be judged. It must provide information "necessary to understand the effects of the alternatives." 40 C.F.R. Section 1502.15. Because of failure to provide a discussion of the present regional air quality, projected emissions control, and adequate projected impacts, the EIS does not provide information necessary to an understanding of the alternatives.

Nor does the DEIS offer an adequate set of alternatives. Conservation measures are not discussed. If sufficient, they would offset a need for this project. The feasibility of such alternate methods can be used to compare the best available means of overcoming our energy problem. Yet the decisionmaker and public are not afforded the opportunity of that comparison.

Applicable federal regulations require that the "information must be of high quality. Accurate scientific analysis .... [is] essential." 40 C.F.R. Section 1500.1(b).

> Agencies shall insure the professional integrity, including scientific integrity, of the discussion and analysis in environmental impact statements. They shall identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement.

40 C.F.R. Section 1502.24.

These requirements are violated by the instances of failure to

use sound scientific methods, to describe methodology, to justify conclusions, or to cite sources. (See 6.)

2. Executive Summary

The Riley Ridge DEIS does not comply with federal statutory and regulatory requirements. Its major deficiencies are:

1. A failure to provide an adequate alternatives analysis.
2. Inadequate description of mitigating measures.
3. A failure to adequately analyze the present air quality and potential impacts.
4. Incompleteness of methods and scope in the cumulative impact study, especially a failure to analyze impacts from emissions of potential well blowouts.
5. Deficiency in the acid deposition modeling and failure to consider alternative models.
6. Worst case incongruities in assumptions and modeling data.
7. The use of unscientific methods, improper assumptions, and inappropriate models.

The remainder of these comments will discuss these deficiencies in particular.

EDF requests that these deficiencies be remedied prior to the release of the final EIS. Failure to correct these deficiencies, we believe, will render the EIS record insufficient, as a matter of law, for the purpose of sustaining final agency action on decisions which may be made in reliance on this EIS.

3. Identification and Analysis of Alternatives

28.1 3.1 The EIS fails to give an adequate analysis of the purpose and need of the proposed action

The Riley Ridge DEIS states that "[t]he recession of 1981-82 and the second drilling actively have resulted in current, producible natural gas reserves which exceed current demand. However, this surplus is expected to be temporary." (DEIS p.1-3). There is no discussion on how the surplus is expected to decline (i.e. what data is available for such a prediction, from where does that data come), nor on what supply or demand reduction alternatives are available through 1990 (when it is predicted that 30% of natural gas needs must come from new wells).

The DEIS predicts that dependence on foreign oils or "other sources of energy" would a consequence of the denial of the project. However, no list is given of these "other sources of energy," nor an attempt made to analyze these alternatives sources.

28.1 (cont.) The Riley Ridge DEIS should include a comprehensive analysis of the need for gas production in light of the stated glut of gas reserves and low demand lasting until at least 1990. This should include a specification of criteria for determining need. Merely stating that 30% of the gas supplies must come from new wells by 1990, and 50% by 2000 does not give an adequate explanation of the "need" for such production. In particular is the EIS's

28.2 failure to consider conservation and other measures as alternatives to gas drilling to meet the need for energy by these dates. These alternative measures were not even mentioned or ruled out

1

28.2 (cont.) in the assessment of the "need" section. The discussion on page 1-3 is inaccurate unless it includes the expanded role that conservation, solar, and wind energy are playing in changing domestic supply and demand. CEQ regulations require EISs to "specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action." 40 C.F.R. Section 1502.13. The law is clear on the requirement that an agency demonstrate the need for a program in the EIS before the proposed action may proceed. Interior's effort to proceed with the Federal Coal Leasing Program was enjoined for the failure of the EIS, among other things, to show a demonstrated need for renewed leasing. Natural Resources Defense Council v. Hughes, 43 F. Supp. 981 (D.D.C. 1977).

Lack of competent assessment of need deprives the decision makers and public, for whom this DEIS is prepared, of the ability to consider fully and balance environmental factors with economic and social values. This constitutes a blatant violation of NEPA's mandates.

EDF recognizes the need for brevity in stating purpose and need. However, the Riley Ridge DEIS fails to meet the standards required by NEPA and CEQ implementing regulations. NEPA requires that the EIS provide information which is "useful in restoring, maintaining, and enhancing the quality of the environment" 42 USC Section 4332(2)(G)(emphasis added). The Riley Ridge DEIS violates the usefulness requirement of NEPA. There is little "useful" information regarding the need for the program in light of the stated glut. Nor is there any useful information (inclu-

ding sources and methodologies) on the means by which this DEIS arrived at its estimations for such a "need" in the future. This information is vital to the readers assessment of the need for the program in comparison with possible energy alternatives. The public and agency decision makers are left with absolutely no basis for determining whether there are environmentally preferable alternatives capable of meeting the policy goals. Furthermore, the policy goals themselves are unclear to the reader.

Since no factual or policy analysis has been presented which would provide a basis for review and comment by the public on the need for the project or on the BLM's methodology for determining need, the DEIS should be supplemented with adequate information and descriptions of assumptions and methodology, and then re-published in draft for meaningful review and comment.

28.3 3.3 The DEIS fails to consider or analyze alternative control technologies.

The modeling analysis for air quality impacts should attempt to evaluate the air quality differences that would result from decreasing emission rates within the range offered by reasonably available choices regarding processes and control technologies. This would require a clear statement of the processes under consideration , and an assessment of available control technologies. The analysis might show that air quality impacts are sensitive to the variation in emission rates as a result of consideration of these factors. If so, then the decision-maker should be informed of those differences and

28.3 (cont.) offered a choice of options as part of his consideration of alternatives and mitigating measures.

PedCo. Environmental, Inc. did several best available control technology (BACT) evaluations for the North Dakota gas production sites at Little Knife, Whitetail, and Williston.[1/] However, in a telephone conversation with Janis VanWyhe, EDF was told that no such evaluation had been made for the Riley Ridge project.[2/] Although the various companies proposed their standards for tail gas cleanup in the Air Resources Technical Report (ARTR), this is not sufficient for a "full and fair discussion." 40 CFR Section 1502.1. Alternative control technologies should be made available as a comparison to the proposed technologies in order to give decision-makers the ability to choose properly.

For instance, PedCo. determined that the Little Knife Processing plant should use a Claus-SCOT unit capable of achieving a total 99.8% removal of sulfur because of its close proximity to a Class I wilderness area. Yet it determined that appropriate burner design and proper operation represented BACT for Amoco's Whitetail Gas Processing plant. Wyoming has permitted a Claus-CBA unit at Whitney Canyon. At that site there is 250 million cubic feet per day in emissions, 12.7% H_2S and 1,266 long tons sulfur/day removed. Yet Utah required a Claus-SCOT unit at their Cave Creek site. There, 250 million ft^3/day was being produced, with 15% H_2S emissions and 1495 long tons sulfur/day being removed. The range of figures' and BACT evaluations are provided to show that such alternative considerations must be analyzed. Even though Exxon is proposing a Claus-SCOT unit at their Riley Ridge

site, designed to recover 99.8% of the plant feed stream sulfur, NorthWest has only proposed a modified Claus technique. This unit would be only 99.4% efficient. An analysis of the feasibility and efficiency of this modified unit cannot be assessed without proper analysis of the alternative control technologies.

In a telephone conversation with Drew Ludwig on July 18, 1983, EDF was told that American Quazar's BACT for sulfur removal is 99.6% control. Assuming that 99.8% is BACT (both for EXXON and the PedCo. determinations in North Dakota), we can compare the emissions rates for SO_2 using Table 1-24 (Riley Ridge DEIS).

SO_2	DEIS BACT	DEIS Emissions (Ton/Year)	99.8% BACT Emissions
Quasar	99.6%	6745	3372.5
EXXON	99.8%	5579	5579.
Northwest	99.4%	3509	877.25
TOTAL		15,833	9,828.75

If 99.8% BACT were used at all plant sites, there would be 6,004.25 tons per emissions reduction. This is over a 1/3 reduction in the proposed emissions. Impacts can be expected to be reduced proportionately. Therefore, it becomes apparent that an analysis of BACT alternatives is an integral part of this study. Such a comparison of figures is essential to proper

decision-making. The BACT alternative discussion is therefore seriously deficient in providing a full and fair discussion of the alternatives.

28.4 3.2 There is a lack of discussion on alternative energy measures such as conservation.

The Riley Ridge DEIS fails to identify and analyze reasonably available energy alternatives. The alternatives identified are limited in this DEIS and do not encompass the scope of alternatives contemplated by NEPA. The alternatives and comparisons to be analyzed as identified in 40 CFR Section 1502.16 include among others:

(d) the environmental effects of alternatives

(e) energy requirements and conservation potential of various alternatives and mitigation measures

(h) means to mitigate adverse environmental impacts

It makes no sense to invest in mammoth energy projects which will have predictable adverse impacts on human health from air pollution, acid rain, and associated impacts on land, water, and wildlife resources just to make heat which escapes out the window. If conservation alternatives can reduce or eliminate the need for further gas production, they will be the most effective mitigation measures and must be considered as reasonable alternatives under NEPA.

For instance, energy conservation measures in existing residential dwellings offer great opportunities for improving end-use energy efficiency. A variety of institutions have recognized the potential and made efforts to encourage or institute conservation programs. The U.S. Congress has directed the Department of

Energy (DOE) to develop the Residential Conservation Service (RCS) which sets guidelines for utility-sponsored programs which will provide financing and installation of conservation and solar retrofit measures. [3/] Many major electric utilities have instituted conservation programs designed especially for existing homes. Pacific Power and Light (PP&L) and the Tennessee Valley Authority (TVA) provide free and comprehensive home energy audits as well as information on finance arrangements and contractors to do the job. TVA offers interest-free loans for conservation measures. The state of Oregon requires its utilities to finance retrofits themselves. [4/] The major California electric utilities now offer zero and low interest loans as well as technical assistance to its customers. [5/] Even General Public Utilities Corporation, the principle owner of the Three Mile Island nuclear power plant, has most recently instituted a conservation program which includes energy audits and minor installation done free of charge. [6/]

The growing trend of utility participation in residential and commercial energy conservation programs indicates their recognition of both the large technical potential to conserve energy as well as economic attractiveness of conservation being the least cost alternative to pursue. The same conservation measures are contributing to the reduction in demand for natural gas and will continue to do so for the foreseeable future.

Several research organizations have investigated the effect of implementing various energy efficient building guidelines. Their performance guidelines, which are usually expressed in

kWh/ft^2, apply to the whole building and provide great flexibility in design and implementation. Important work has been done by the DOE; Lawrence Berkeley Laboratory (LBL); American Society for Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE); and the American Institute of Architects Research Corporation (AIARC).

In the DOE minimized life cycle, costs are the basis for the standards. A computer model is used to determine changes in heat transfer within the prototype unit for each measure added. The measures included in the model are designed to improve the thermal integrity of the building and be economically justifiable while maintaining (or improving) human comfort. A comparison is made between the increased investment in energy conservation and the dollar (energy) savings during the life of the building. The energy requirements necessary to meet the efficient standards are referred to as the Design Energy Budget (DEB).

In the model conservation measures are added in order of decreasing benefit cost ratio (i.e., the ratio of dollar savings in energy to costs of conservation measures) until the ratio is just equal to one. The DEB is the energy budget that minimizes life cycle cost. It is described in terms of $BTU/ft^2/yr$. The model prepares energy budgets for different cities and building types. DOE has termed these energy budgets as Building Energy Performance Standards (BEPS). They were issued in November 1979 in a Notice of Proposal Rule-making on Energy Performance Standards for New Buildings. [7/]

Sensitivity of performance standards to different building parameters and their applicability to different housing types are two of many issues still subject to discussion. But in its evaluation, LBL shows that BEPS are relatively insensitive to most variation in house design. [8/]

Although the DOE's BEPS program was not implemented, the institutes and organizations listed above report that the technical potential for energy conservation in both residential and commercial buildings is very high. [9/] This potential should be evaluated as an alternative to increased gas production. First, the evaluation should include consideration of the extent to which energy conservation measures are being implemented and thereby will reduce demand and, in turn, affect the need for the project within the context of 3.1 (above). Second, the evaluation should consider the extent to which government actions can induce additional conservation measures, the comparative economic and environmental costs of those actions and their suitability as an alternative to the project or as a mitigating measure (determining by reducing the size of the project and its impacts).

28.5 3.4 The DEIS is deficient in its study of the existing environment.

The Riley Ridge DEIS violates NEPA standards in failing to address the affected environment is its present air quality state. While the air quality impacts are among the most critical of the projected effects (and the most well-researched in the ARTR and DEIS), the discussion of the present state of air quality is very weak. The discussion of this "present state" is not found within the boundaries of the air quality sections;

28.5 (cont.) neither is it found in the "no-action" alternative. The final EIS should make clear the state of present air quality so as to afford a comparison with the predicted impacts. This will afford the reader and the decision-maker a sense of the environmental consequences of the action as compared to alternative energy source impacts.

CEQ regulations specify the criterion by which the sufficiency of the discussion of the affected environment is to be judged. It must provide information which is "necessary to understand the effects of the alternatives." 40 C.F.R. section 1502.15. The fact that "measurement sites are relatively far removed from Riley Ridge" (p. 3-35) does not suffice as giving accurate data for the existing air quality of the region. If such data could not be obtained by putting monitoring equipment within the Riley Ridge region, such discussion should have been included. The final EIS should clarify and include:

1) the source for these decisions (to go to off-site data for evaluation), and

2) scientific reasoning for the percentage of accuracy of this data as representative of the Riley Ridge region.

28.6 3.5 Mitigation measures in the DEIS are insufficiently described and in some cases nonexistent.

The Riley Ridge DEIS states, "[s]torm water runoff from construction of the sulfur loadout facility near Opal could result in a small increase in sediment delivered to Hams Fork. Impacts would be minimal and insignificant since erosion control measures would be used." (Riley Ridge DEIS at 4-26). However, the DEIS fails to mention what this "erosion control measure" is.

28.6 (cont.) The most likely place for such a discussion is in the section entitled "Mitigating Measures." However, there is no mention there of any control measures for erosion at Opal. If this is discussed in the DEIS, there should be cross referencing with all sections which mention this control measure. The reader should not have to guess where such information lies. Furthermore, if the predicted degree of environmental impact is dependent on the use of specified control measures which are not otherwise required by law, then these should be identified as needed mitigation measures. If they are otherwise required by law, the legal requirement should be cited.

28.7 Also, the DEIS discusses the probability of a molten sulfur spill into various streambeds. If these spills are considered for the toxicity to wildlife in the region, why are they not also considered in establishing mitigation measures. There is no mention in the mitigating measures section of any attempt to clean-up a molten spill. If these types of spills cannot be adequately cleaned-up, for such reasons as river transport, etc., it should be mentioned in the final DEIS. Explanation of why they cannot be cleaned-up (i.e., economic reasons, impossibility, etc.) as well as sources for these reasons, should be listed.

3.6 The No Action Alternative is deficient because it fails to discuss existing air quality as a comparison for the proposed project.

28.8 The no action alternative is deficient in one regard becaue it fails to explain its conclusions. One of the consequences discussed in this alternative involves the failure of the U.S. to reduce national dependence on foreign energy supplies if the

28.8 (cont.) Riley Ridge project were denied. However, no basis is given why we would have this dependence in the event of project denial. Nor are any alternatives discussed which could be used to avoid this dependence.

This deficiency can be remedied only by analyzing the current and projected market for natural gas. The analysis should consider: 1) an assessment of the domestic demand for natural gas over a reasonable planning horizon such as 12-20 years, including an analysis of recent reduction in demand resulting from conservation and the opportunities for additional conservation during the planning period, 2) an examination of the current supply and projected recoverable reserve of other sources of fuel demands taking into account both the costs of producing and delivering BTU's to the consumer, 3) a comparison of the costs of producing and delivering natural gas with the costs of producing and delivering BTU's from other fuel sources and expected changes in those costs ratios during the planning horizon, and 4) a determinatin as to whether the amount of natural gas in private ownership or already under lease is adequate to meet the projected demand.

28.9 There is no discussion of the present state of air quality in the no action alternative. Such a discussion is necessary for the "full and fair discussion" requirement under 40 C.F.R. Section 1502.1. This discussion would give the reader and decision-maker a basis for comparison. If this discussion is included, it is well hidden from the reader, and should be clarified and highlighted in the final EIS.

4. Air Quality Analysis

28.10 4.1 In some respects, the Cumulative Impact Study for Riley Ridge is deficient.

4.1.1 The Riley Ridge project DEIS considers some, but, not all of the possible cumulative impacts.

Of particular note in this deficiency is the DEIS's failure to consider anything outside the Riley Ridge "region" as a possible cumulative source. (The region's boundaries are delineated in the DEIS and discussed below). In particular, the DEIS has failed to consider emissions source growth in the Uintah and Piceance Basins as sources contributing to cumulative air quality impacts. According to the DEIS, the wind for that region is predominantly from the West and Southwest. (Riley Ridge DEIS at 3-29). If this is so, there is a great chance that emissions from Uintah and Piceance Basins would affect the same receptors as those to be affected by the Riley Ridge development. Pollutants such as SO_2 and NO_x can be carried long distances and can change their direction with the wind. It is therefore possible for pollutants from the Uintah and Piceance Basins to take both direct and indirect "routes" to Riley Ridge before settling out in their primary or secondary forms as wet or dry deposition. Considering the growing body of evidence of the long-range transport of these pollutants in the atmosphere, a study of cumulative should include an evaluation of SO_2 and NO_x effects from these two Basins in addition to the new sources in the Riley Ridge project.

28.11 The drafters of the DEIS delineated the study region as being bounded by the Wyoming-Utah border to the South. On the

28.11 (cont.) western border of the region is the Wyoming Range and Bear River Divide. On the northern and eastern borders are the Wind River Range and Great Divide Basin. However, the drafters gave no reason why these boundaries were chosen as the project's study area ("region"). (Riley Ridge DEIS at 3-29). It can be implied from the comments on p. vii that the DEIS drafters did not believe outside sources would significantly contribute to the cumulative impact. If this is the conclusion of the drafters, it should be stated explicitly in the final EIS. If it is not intended, this should also be stated. In addition, documentation is entirely missing to back-up these statements.

The Uintah Basin EIS, which addressed oil shale and tar sand development in eastern Utah, considered impacts as far away as the Flattops in Colorado in their modeling analysis. This distance is approximately 132 miles. The distance from the Uintah Basin to the Riley Ridge project area is approximately 168 miles, yet no cumulative impacts were modeled in the Riley Ridge DEIS from this source. The distance from the Uintah Basin to the proposed Class I area called Fossil Butte is approximately 148 miles. Impacts on that region, however, were modeled only from the Riley Ridge sources. Again, the distance from the Uintah Basin to the Class I area at the Wind River Mountains is approximately 176 miles. The corresponding distances from Piceance Basin to Riley Ridge Basin, Fossil Butte, and the Wind River Range are approximately 236 miles, 232 miles, and 212 miles respectively. (The Wind River Range figure was taken from its southern-most point, so another 16-64 miles must be added to get

28.11 (cont.) the full range of the affected area). If the Uintah and Piceance Basin EISs can model impacts as far away as Flattops, it should be within the Riley Ridge EIS capacity to study cumulative effects from sources at about the same distances. EDF requests that the model be run again with the source inputs prepared for the Uintah Basin EIS. The source terms may still be available on tape.

28.12 Considering these distances (in hundreds of miles) EDF cannot understand why the DEIS concludes that no cumulative impacts are expected from Whitney Canyon and Carter Creek Canyon. In particular, the DEIS stated that Whitney Canyon had relatively large SO_2 emissions (3,117 pounds/hr.) and is 39 miles from the nearest Riley Ridge proposed plant. While they expected annual average impacts, no 3 hour or 24 hour SO_2 impacts were predicted. This is hard to understand given the DEIS insistence that 39 miles was a relatively "large" distance to the proposed plant site. If the Uintah Basin EIS can consider distances of hundreds of miles in studying cumulative effects, the Riley Ridge EIS can at least analyze a distance of 39 miles for cumulative impacts instead of dismissing it as insignificant.

Except for the failure to include sources in the Uintah and Piceance Basins the DEIS should be commended for analyzing cumulative impacts from existing and proposed sites within the study region. The Riley Ridge project DEIS went beyond this and analyzed cumulative impacts for several existing sites and some

28.13 proposed sites (See table 1-19, Riley Ridge DEIS). The criterion used for chosing the "likely" proposed sites is stated in the

28.14 4.1.2 The Riley Ridge DEIS fails to consider cumulative impacts from its predicted well blowouts.

A well blowout was defined as an uncontrolled release of gas to the atmosphere. (Health and Safety Technical Report at 3-3) (HSTR). The average length of a blowout is 3 days. The DEIS accumulated data to estimate the number of well blowouts it could expect during the lifetime of the project. According to the HSTR and the DEIS, 2.8 well blowouts would occur during the drilling and producing lifetime of the project (Riley Ridge DEIS at 4-31). Appartently, one blowout has already occured.

While the DEIS has assessed the cumulative risk to humans in the area if a blowout would occur (Riley Ridge, pp. 4-31 through 4-33), it has not taken into account the air quality impacts due to these proposed blowouts. In the HSTR the drafters stated, "A blowout modeling analysis was undertaken to estimate the health impacts that could occur ..." (HSTR at 2-10). Yet nowhere in the DEIS is there any mention of modeling analyses for cumulative impacts to the air quality. A predicted 3 day release of uncontrollable gas would undoubtedly create some impact to the air, or in the very least, some synergistic effects to the surrounding air mass.

The DEIS used several models, including worst case, air quality, etc., to determine the impact on the human environment in the area. Meteorological data (i.e., wind, modeled atmospheric conditions, etc.) were used to determine how far a lethal concentration of H_2S gas would travel. Yet again no mention is given of the cumulative effects on air quality.

Granted that human health and safety comes first, but the DEIS should look beyond immediate needs in these areas. Just because lethal doses pose a health problem immediately after a blowout does not mean it won't cause a broader range of environmental impacts by causing changes in the composition of biological communities or contributing significantly to acid deposition downwind.

28.14 (cont.) The final EIS should evaluate of the cumulative effects of these blowouts. This study should include air quality analyses, visibility impacts on Class I and Class II areas, and odor impacts to the surrounding region. Included should be a discussion on any exceedances of WAAQS and NAAQS or other standards.

While flaring may have been included in an analysis of cumulative air quality impacts, this has nothing to do with well blowouts. In a telephone conversation with Ann Berman, EDF was told that flaring was included. [10/] We do not doubt this, but wish to point out that in the glossary of the DEIS, flaring and well blowouts are separate occurrences. Therefore, the final EIS should not dismiss this discussion under the false assumption that it has already been included in the cumulative impacts study.

28.15 4.1.3 The DEIS dismisses cumulative impacts on the Popo Agie and Fitzpatrick Primitive Areas.

The Popo Agie and Fitzpatrick Primitive Areas were not studied because the DEIS assumes that plume advections could not travel over the 13,000 ft. (average) height of the Wind River Range. However, there are several examples (most notably high

28.15 (cont.) altitude transport of SO_2 in the eastern U.S.) which draws us to the conclusion that such advections are possible.

If this is so, the DEIS has failed to give an adequate description of cumulative impacts by including these two Class I primitive areas. While high altitude transport was once thought to disperse SO_2 (and thus end the acid deposition problem), we are finding out that this is not so. It merely adds to longer range deposition problems. What this implies is that when the advections travel over the Wind River Range, they will interact with already existing SO_2 pollutants in the atmosphere. The possibility for wet and dry deposition (especially in the form of snowpack on the northeastern slopes of the Wind River Range) would be substantially increased. (See, "Large Scale Transport of Fine Sulfur Particles in the Intermonte United States," by Lowell L. Ashbaugh, especially Chapter 5. Attached as EDF Exhibit H . Certain impacts are related to chemical conversion. This is especially true for visibility and acid deposition impacts. Accumulation of precursors prior to transport makes the effective travel time longer and allows more time for conversion resulting in greater impacts. This increase can be of even larger dimension if there is accumulation from different sources, leading to possible source interactions.[11] To leave a study of

28.15 (cont.) these impacts out of the final EIS would not be giving the reader a full and fair discussion of all the impacts due to the Riley Ridge project.

On the other hand, if the assumption that transport will not extend beyond the Green River divide, then the total sulfur and

28.15 (cont.) nitrogen emissions from the sources must be deposited within the study region. The deposition modeling presented in the acid deposition analysis does not do this. It predicts only a limited portion of total emissions as being deposited in the region. You can't have it both ways. Either the plume comes over the mountain or the sulfur all drops out in the study region.

4.2 There is a deficiency in analyzing visibility impacts on Class II areas.

28.16 Visibility impacts should be evaluated for non-Class I areas as well as Class I because they are one of the most likely to be impacted by new source emissions on the region as a whole. The DEIS seems to focus on pristine PSD Class I areas (Riley Ridge DEIS at 3-35). The drafters presume that if impacts to Class I sensitive areas are tolerable, then impacts to other, less sensitive areas would also be acceptable.

The fact that EPA's visibility regulations focus on plume blight in Class I areas is no reason for excluding regional haze impacts or plume blight impacts on the entire region where perceptible changes in visibility will occur. Clean Air Act visibility protections do not distinguish between plume and regional haze impacts, nor is the visibility analysis required by section 165(e) limited to Class I areas. The Grand Teton and Yellowstone ranges were surveyed by the ARTR. Since these areas are Class I, it can be implied that the EIS meant to survey only Class I areas for visibility impacts. Since visibility impacts on Class II areas will undoubtedly affect numerous uses and values of the Riley Ridge Basin areas outside of Class I areas (i.e., tourism, hunting, fishing, recreation, etc.), and

that visibility impacts are likely to be greater in the Class II areas closer to the sources, it is important that the final EIS include a discussion of the impacts on these areas as well. A full and fair discussion of significant impacts must include a complete discussion of visibility impacts.

28.17 At the very least, in order to provide the reader with information necessary to understand the effects of the alternatives, a true worst case visibility analysis, appropriate for complex terrain, should be done. This should include such features as: 1) a reduction of wind speeds to increase travel time, in order to simulate the more convoluted trajectories probable over complex terrain, 2) a shift of initial/arrival times to simulate travel during the time of day with most intense radiation, 3) an increase in stability, to account for the possiblity of the frequent Riley Ridge Basin inversions coinciding with worst case trajectories, and 4) simulation of multi-day stagnation episodes which occur in the Riley Ridge region.

Also, as with our arguments on the deficiency of discussion of existing air quality (see 3.4 and 3.6), the DEIS does not adequatly analyze or display data for existing visibility in the Riley Ridge Class II areas. Visual ranges were measured for the Grand Teton and Yellowstone National Park areas. This is not a fair discussion of the proposed area. The reader cannot make a judgment on a comparison of no action and proposed action impacts when data is not a available to do so. If such data are not avaiable, estimates should be made based on measurements outside the region using the same logic as that used to estimate other

air quality parameters. See Section 165(e).

28.18 4.3 Acid Deposition Studies in the DEIS were Deficient.

While we think the following deficiencies are very significant in that they frustrate our ability to evaluate the results of the acid deposition impact analysis, we congratulate you for the effort invested in developing a methodology suitable for modeling the acid impact of new sources. This is definitely the most sophisticated effort of its kind. We generally find the methodology acceptable with the exception of those deficiencies outlined below, and your failure to expand the input region for this assessment to include other proposed major sources of acid precursor pollutants only 10-12 hours upwind.

28.18 (cont.) 4.3.1 The DEIS fails to present essential data.

The DEIs reports that alkalinities in certain lakes in the Bridger were measured by ERT during 1982. Alkalinities are an important data point in the calculation to determine resultant pH in the lakes. The measured alkalinities are not reported. Nor is there any analysis of the data collected from the three identified lakes to evaluate their representativeness for the cohort of lakes in the study region. The hypothetical in the ARTR, p. 3-57 shows a resultant pH change of .22 assuming an alkalinity of 100. The DEIS reports a resultant pH change of only .05 which suggests that alkalinities in the 3 lakes are high, in a range above 200 ueq/l. The data collected in similarly situated lakes in Rocky Mountain National Park shows alkalinities as low as the 20's. [12/] Unless a statistically significant population of lakes was sampled to allow a

calculation of the lower bound of lake alkalinities, the use of high alkalinities measured at only 3 lakes is inappropriate. Given the failure to report measured data, the public can make no evaluation of the representativeness of these data. We therefore request that the lake pH calculations be based on worst case assumptions. Worst case conditions should be assumed to be the same as those measured in the most sensitive lake in RMNP. This assumption is justified given the similarity in altitude, bed rock, soils development, precipitation rates and vegetative cover between the Bridger lakes and those sampled in RMNP.

28.18 (cont.)

28.19

4.3.2 The report fails to compare increased deposition with background deposition.

The DEIS fails to report calculated deposition rates resulting from emissions in the study area (only methods are reported in the ARTR). In addition the DEIS fails to report or estimate background deposition, and therefore precludes any meaningful comparison between what impacts are being experienced by the affected environment now compared to those which are expected to result from the proposed action.

Data collected by the NADP in Wyoming may be suitable for making general comparisons. [13/] The only NADP station in Wyoming is in Yellowstone N.P. Data reported there for 1980 and 1981 indicate sulfate deposition of about .5 g/m^2-year, or about .16 g/m^2-year of total sulfur. Nitrate deposition of about half that rate is also reported.

Assuming these rates are representative of deposition in the Bridger, some longer-term comparisons with other environments could be approximated if we knew what the predicted total

deposition is (i.e., increased deposition from new source emissions plus background). As Dr. Oppenheimer points out in his testimony to the Colorado Air Commission,[14/] long term effects can be approximated by comparing deposition rates with other areas of the world where significantly elevated rates of acid deposition have occurred over extended periods (decades). He points out that the Stockholm Conference report on acid rain identifies .5 g/m^2-year of total sulfur as an approximate threshold for damage to sensitive environments.[15/] Given the statement of the DEIS that longer-term impacts of continuous deposition from the new sources are not being addressed at this time, it would be appropriate to compare predicted total deposition with the Stockholm report as the best approximation available to assess long-term impacts resulting from the consumption of buffering capacity in the watershed.

28.19 (cont.)

28.20

4.3.3 Acid Deposition Studies of Sensitive Species is Deficient.

In the Riley Ridge DEIS, the authors talk about "human population related impacts" (i.e., legal and illegal hunting and fishing, wildlife harassment, road kills, and unintentional disturbances). But no mention is given as to damages from cumulative air pollutant emissions in the area. Table 2-1 does not give the sources for expected disturbances and therfore does not give the reader a full understanding of the magnitude of cumulative emissions on fisheries. If this study was done as part of the Wildlife and Fisheries Technical Report (WFTR), then it should be highlighted better in the final EIS. Since the Colorado River Cutthroat Trout is considered a "rare species" by

the Wyoming Game and Fish Department (WGF), and a "sensitive species" by BLM and FS, then acid deposition impacts should have been assessed for these fish. The three lakes in the Bridger Wilderness studied for acid deposition impacts have no cutthroat trout. If these species are "sensitive" and "rare," a study should have been done on those streams, rivers, or lakes where the cutthroat resides. Cutthroat studies should focus on its tolerances of changes in pH and the mobilization of heavy metals associated with pH change in highly mimeralized, low buffered watersheds. In table 3-1 and the accompanying discussion, several cutthroat trout streams are analyzed, but not for cumulative acid deposition impacts. Discussion of significant impacts for fisheries dealt with chemical spillage which exceeds WDEQ water quality criteria (Riley Ridge DEIS at 4-17).

With expected levels of pH at 6.3 in one lake (Clear Lake South), the EIS should be more concerned about the more "sensitive" fish such as the cutthroat trout. Even if the pH Significance Criterion is pH 6.0, we do not know about cumulative affects of acid deposition from sources outside the area. Therefore, it would be wise to overestimate in these assumptions to protect to "rare" and "sensitive" cutthroat.

28.21 4.4 There is No Discussion of the Potential for the Impact of Hazardous Pollutants.

There is no discussion of the impacts of hazardous pollutants such as heavy metals or radioactive compounds. If these are not significant issues, the final EIS must contain enough discussion to 1) assure the reader that a sufficient analysis of its significance has been done, and 2) explain the

28.21 (cont.) basis on which a determination of non-significance is based.

28.22 4.5 There is no discussion of the "Greenhouse" effect created by CO_2 emissions.

An analysis comparing various fuel supply and conservation alternatives should include an evaluation of the rates of CO_2 production associated with each. The evidence is rapidly growing to support the conclusion that CO_2 accumulation in the earth's atmosphere will have a dramatic, if not catastrophic, impact on the human environment. The scientific debate has generally shifted in recent years from whether there will be a "greenhouse effect," to how wide-spread that effect will be. Included in the likely affects will be reduced precipitation, reduced agricultural production and increased food shortages for a growing world population. [16/] Given the probability of such large-scale impacts within 50 years or less, it is critical that modern industrial society begin the search for either substitutes to current carbon-fuel combustion energy sources, or carbon-based fuels that reduce the rate of CO_2 growth in the atmosphere. With this serious environmental problem in mind, alternate sources of fuel should be compared with respect to the amount of CO_2 formed by each process per unit of available energy produced. In addition, the economic and technical feasibility of the hydrogren fuel cycle should be considered as an alternate source of energy.

28.23 5. The Worst Case Model is Deficient.

5.1 Some Assumptions are not Accurate and Lack Rationalization Through Scientific Means.

The DEIS study predicted SO_2 and NO_x concentration using two sets of meteorological data. The first is an assumed worst case

28.23 (cont.) analysis. The second is the actual measured off-site data. According to the drafters of the DEIS, the latter is considered to be more representative and is used in this analysis. (Riley Ridge DEIS at 4-42). However, this conclusion is unfounded and gives the reader no basis for judging the reliability of that decision. It seems that off-site data would be just as inaccurate as modeled data when assessing impacts at the Riley Ridge site. For this reason alone, the final EIS should provide an explanation of its determination in the DEIS that off-site data was more representative.

In the ARTR, the drafters chose 1985 as the potential worst case source scenario year because it is the year in which well field sources would be in closest proximity. (ARTR at 3-33). This assumes that the proximity of well fields is the most important data is assessing worst case impact. This assumption is not even justified in the DEIS or ARTR. Moreover, it seems more reasonable to assume worst-case scenarios in years where maxiumum production capabilities will be realized. According to the DEIS, 1985 is the second year of well construction in a 30-40 year span project. (Riley Ridge DEIS, figure 1-2, p. 1-19). Peak efficiency of well operations could not begin at least until 1990. Therefore, in choosing 1985 as the representative worst case year for the model does not afford the professional integrity necessary for good judgment.

28.23 (cont.) EDF suggests using a year more representative of peak production in the analysis of cumulative impacts. Off-site data

28.23 (cont.) may be helpful, but modeling worst case is just as important, and should not be deemphasized.

28.24 5.2 Worst Case Modeling Data are Insufficient for Proper Analysis.

The ARTR used only one year of meteorological data for the Complex I program is assessing worst case conditions. The regulations require that EIS "shall include a worst case analysis and an indication of the probability or improbability of its occurrence." 40 C.F.R. section 1502.22. The requirement that the probability of occurrence be indicated implies that more than one year of data be used. To use only one year of data would negate any indication of its probability as worst case. Data of this sort becomes meaningless. Rather, the EIS should take a sampling over a period of time in order to gain the scientific integrity called for in the statute.

Use of only one year of data also violates the EPA recommendation that five years of data be used. [17/] If such data is not available, the drafters should explain this explicitly in the final EIS. Also, mention should be given as to the probability of the existing data as representative of the worst case model.

28.25 6. Scientific Integrity Standards Are Violated.

6.1 There is an Inadequate Explanation of the Wind Rose Figures in the DEIS.

The reader is mislead by the type of wind rose figures (i.e., Riley Ridge DEIS, figures 1-7 through 1-12) used in both the DEIS and ARTR. There is no indication of the direction in which the wind blows. For example, figure 1-7 has a "westerly

28.25 (cont.) component" of 15% at 10.8 m/s. But this does not tell the average reader from what direction the wind is blowing. Does it blow from west to east or from east to west? While this may be second-hand knowledge in the scientific community and to the EDF, the public may not be able to decipher this knowledge EDF suggests that in the final EIS revision be made of these figures to include an explanation as described above. This is in conformity with 40 C.F.R. Sections 1502.1 and 1502.8 that "statements shall be concise, clear, and to the point ..." and "... shall be written in plain language and may use appropriate graphics so that decision-makers and the public can readily understand them."

28.26 6.2 Use of Some Terms in the DEIS is Misleading.

The use of the terms "significant" and "highly significant" in tables 4-40, 4-41 as discussed and defined on p. 4-55 tend to demean the weight of these words and mislead the reader. The use of the phrase "highly significant" tends to demean the import of the "significant" criterion used. Rather, these terms should be changed to connote to the reader the seriousness of their import. EDF suggests, as an alternative, changing the phrase "highly significant" to "serious" to maintain a balance among the connotations of each word.

28.27 Also, the final EIS should make clear to the reader whether these terms are used to mean irreversible damage or not. If the impact is irreversible, some mention of it should be given in the tables to better assess the significance criterion.

28.28 Moreover, the FS and BLM have issued a "may affect" decision on potential impacts to the black-footed ferret (Riley Ridge DEIS

28.28 (cont.) at 4-30). This is considered a significant impact. But there is no discussion on how such a decision is made, who makes it, and what are its consequences. This should be clarified in the final EIS.

28.29 Several times in the EIS personal judgment is used as a conclusion to scientific analyses (See for example Rileg Ridge DEIS pp. 3-17, 3-18, 3-20, 4-68). While the difficulty of obtaining data in the time provided is recognized (the time restraints are not inflexible and are self-imposed) "personal communication" is an insufficient description of the methodology used. If, as on p. 4-68, "similar conditions could be expected for the Riley Ridge Project," some assurance of professional integrity must be given. To comply with NEPA regulations, there must be some specification of the 1) source of data, 2) cases in which judgment was used, 3) the type and extent of this judgment, and 4) its probable accuracy, error bounds, and effects on estimates of impacts. The Riley Ridge DEIS satisfies (1) above, but the final EIS should be expanded to include the remaining data sought. Without some indication of the non-speculative nature of the estimates, the numbers cannot be relied upon in the decision-making process. Left alone, such data may tend to mislead, rather than inform, the decisionmaker and public.

The usefulness standard of 42 U.S.C. Section 4332(G) is also violated by this omission of information. This is because the reader cannot evaluate the range of possible estimates which might be reasonable if some assumptions are modified.

28.30 6.3 The DEIS Fails to Justify Some of its Conclusions.

Besides those cases already cited throughout these comments, the DEIS fails to adequately justify its conclusion that precipitation patterns at higher altitudes are sufficient for estimating lower altitude precipitation patterns. (See discussion in ARTR at 3-42). The exact phraseology is "probably adequate" but no mention is given of where this determination came from. If personal judgment was used, it should be stated, and the source cited. Also, an analysis of the alternative methodologies for arriving at this or other conclusions should be made available.

FOOTNOTES

1/ These sites are: Warren Petroleum Little Knife Gas Processing Plant, Contract No. CX-0001-1-0117, Task Order No. PX-0001-2-0416, Project No. 3555-2 (May 1982); Amoco Whitetail Gas Processing Plant, Contract No. CX-0001-1-0117, Task Order No. PX-0001-2-0416, Project No. 3555-2 (May 1982); Phillips Petroleum Gas Processing Plant (at Williston), SAME. These analyses are attached hereto as EDF Exhibits A, B, C, D.

2/ Personal Communication with Janis Van Wyhe of the Bureau of Land Management, Division of EIS services, Denver, Colorado, 30 June 1983.

3/ National Energy Conservation Policy Act (NECPA) Pub. L. No. 95-619, 92 Stat. 3206 (1978); Federal Register Vol. 44 No. 217, 7 Nov. 1975.

4/ Tennessee Valley Authority. Program Summary, Division of Energy Conservation and Rates. (Knoxville, Tenn.: April, 1981); "Utility and Power Picture: North Western States Develop Energy Conservation Programs," Building Energy Progress. Jan./Feb. 1980.

5/ "California Orders its Utilities to 'Unsell Energy,'" Business Week, 26 May 1980; "Financing the Solar Transition, A Report to the California Legislature," (Sacramento, CA 2 Jan. 1980).

6/ General Public Utilities Corporation, "Conservation and Load Management Master Plan." 28 March 1980.

7/ U.S. Department of Energy (DOE). Energy Performance Standards for New Buildings. Notice of Proposed Rulemaking and Public Hearings. November 1979. Section 2.

8/ Lawrence Berkeley Laboratory (LBL), University of California. Evaluation of Residential Building Energy Performance Standards. (LBL-9816). Dec. 1979.

9/ For an excellent summary see Solar Energy Research Institute, A New Prosperity Building A Sustainable Energy Future. (Andover, Mass.: Brick House Publishing, 1981) Introduction and Chapter 1.

10/ Personal communication with Ann Berman, Manager, Energy Development of the ERT, 22 June 1983.

11/ Wilson, William E. et al, 1977 Sulfates in the Atmosphere, Research Triangle Park, North Carolina, U.S. EPA publication number EPA-600/7-77-021.

12/ Baron, J., Alkalinity data collected from four lakes in Rocky Mountain National Park, July-November, 1981, National Park Service, Water Resources Laboratory. Reported in a letter to Bob Yuhnke, 3 Dec. 1982. Attached as EDF Exhibit E-7.

13/ Gibson, J.H. Memo on NADP Data Summary of 1980-81 Annual Averages (Preliminary Data) for Wyoming site. Attached as EDF Exhibit G-1 and G-2.

14/ Oppenheimer, Michael. "The PSD Increments And NAAQS for SO_2 Do Not Protect Against Acidification of Sensitive Environments: Colorado Needs an Acid Deposition Standard," Environmental Defense Fund Exhibit number 32 to the Colorado Air Commission, December 3, 1982, p. 2.

15/ Report of the 1982 Stockholm Conference on Acidification of the Environment, Annex 3: Major findings and Conclusions of the Expert Meetings. Swedish Ministry of Agriculture, 1982.

16/ Council on Environment Quality, Global Energy Futures and the Carbion Dioxide Problem (Washington D.C., January, 1981).

17/ Guidelines on Air Quality Models, U.S. EPA number 450/2-78-027 p. 32.

NOTE: Exhibits A,B,C,D,E,E-1,E-2,E-3,
E-4-1,E-4-2,E-5,E-6,E-7,F,
G-1,G-2,H

are in the offical EIS file.

Responses to Comment Letter 28

28.1 The purpose of the Riley Ridge Project is to develop natural gas leases which are currently held by the applicants and other lease holders. Since the Riley Ridge EIS deals with the granting of right-of-ways for the development of existing leases and *not* the issuance of new federal natural gas leases, the BLM and FS have relied on material provided by the applicants regarding the need for the project. This information is presented on page 1-3 of the DEIS. The schedule for developing the Riley Ridge leases is dependent on the applicants' assessment of current and future market conditions and natural gas supplies. The ability to make a profit from the project is, of course, a major consideration. For a given applicant, timing of development can also be linked to existing contracts it holds for the sale or purchase of natural gas as well as to national market conditions. Therefore, it is not appropriate for the BLM to conduct a detailed market analysis as part of the preparation of the EIS.

28.2 CEQ regulations (40 CFR § 1502.14) require that an EIS address "reasonable alternatives" to the Proposed Action. Conservation and alternative energy sources, such as wind and solar, would not satisfy the purpose of the Riley Ridge Project, i.e., to develop existing natural gas leases. See Response to Comment 28.1 for further discussion on the purpose and need for the Riley Ridge Project.

28.3 Sulfur control for the Riley Ridge gas treatment plants would range between 99.4 percent (Northwest) and 99.8 percent (Exxon). The control technologies used to achieve these results were selected by the applicants based on engineering parameters and the ability of the technology to meet air quality standards. Alternative air quality control techniques are not alternatives a federal land manager may choose. An analysis of this type will be required as part of the Best Available Control Technology (BACT) Assessment of the PSD permit application. The Wyoming Department of Environmental Quality will review the applicants' proposed emission controls and other alternatives as a part of that application process.

28.4 Conservation has not been considered as an alternative to the Proposed Action because it would not satisfy the purpose of the Proposed Action, i.e., to develop existing natural gas leases. Further, numerous studies are currently available which discuss the possibilities for the benefits of energy conservation. Several of these are cited by the commenter.

28.5 The existing air quality within the Riley Ridge Project area is discussed on page 3-35 and Tables 3-22 and 3-23 of the DEIS. Air quality data for the proposed gas treatment plant sites is currently being collected by the applicants. When available, this data will be used to refine the conservative estimates presented in Table 3-23 on page 3-36 and will be used for the applicant's air (PSD) permits which would be issued by the Wyoming Department of Environmental Quality.

The affected environment is covered in additional detail in pages 1-1 through 1-31 of the Air Resources Technical Report, the availablility of which was cited in the Preface of the DEIS. The technical report forms a part of the total EIS. These discussions describe the affected environment and, as required by CFR 1500.15, are no longer than necessary to describe the affected environment and understand the impacts of the Proposed Action and Alternatives.

28.6 The erosion control measures referenced from page 4-26 of the DEIS are not intended to be specific at this point in time. The intent of the statement was to reference that erosion control measures will be applied. General erosion control guidelines are presented in Appendix B.7 of the DEIS. Specific erosion control measures for the sulfur loadout (and all other facilities) will be contained in the applicant's Construction and Use Plans which must be submitted to the BLM and Forest Service before a right-of-way is granted. The reason erosion control measures are not contained under Mitigation Measures is that erosion control is part of the applicants' proposed action and/or the agencies standard requirements.

28.7 As stated on page 4-29 of the DEIS, a spill of sulfur into a stream from the molten sulfur pipeline is not considered probable during the life of the project. As stated on page 1-30 of the DEIS, any sulfur drained from the pipeline during maintenance or emergency operations would be cleaned-up and the disturbed area restored and revegetated. It should be clarified that the BLM also would require the clean-up of any spill from the sulfur pipeline. A spill contingency plan, a mitigation measure for upset or accident conditions, will be included as part of the applicants' Construction and Use Plans.

28.8 The statement on page 4-130 of the DEIS in no way implies that the Riley Ridge Project would solve the nation's dependence on foreign sources of energy or that project denial would cause this dependence. Simply restated, the No Action Alternative would prevent the production of 576 million cfd of domestic natural gas. The BLM and FS do not deem it necessary for this EIS to document the causes of the nation's energy dependence nor to conduct a natural gas market analysis (see Response to Comment 28.1).

28.9 The affected environment for the No Action Alternative is the same as for the Proposed Action and other Alternatives. As stated on page 3-1, of the DEIS, left hand column, "For other resources, such as air resources and socioeconomics, a required study area was delineated, these resources treated the affected environment in a regional context". The text has been clarified. See Errata Summary for page 3- in the DEIS.

28.10 Emission sources associated with oil shale development located in the Uinta and Piceance Basins were reviewed and not included as interrelated projects. These sources would be located to the south and east of the proposed Riley Ridge development. As indicated by the various wind roses in the DEIS and Air Resources Technical Report, and Final Air Quality Technical Report for the Uintah Basin FEIS, transport of emissions from the southeast is highly improbable. In addition, substantial terrain relief in the form of the Uinta Mountains exists along probable transport trajectories. Any plumes from the Uinta and Piceance Basins that did reach the project area would be highly dispersed and would not make a significant contribution to any cumulative air quality impacts.

28.11 The air quality study region boundaries are defined by the boundaries of the Sublette Air Basin. The EIS and Air Resources Technical Report have been changed to indicate this. Please see the Errata Summary for page 3-29 of the DEIS. Response to Comment 28.10 provides the rationale for not including emissions from sources outside the study area.

28.12 See Response to Comment 18.1.

28.13 The selection of interrelated projects was somewhat subjective in that it was based on the three criteria mentioned on page 1-53 of the DEIS and professional judgement. Several lists of potential projects were prepared for review by technical specialists and federal and state agency representatives. The list of interrelated projects was periodically revised throughout the preparation of the DEIS as new information became available. If there was any question whether a proposed project would add to cumulative impacts from the Riley Ridge Project, it was included for analysis. Without reference to a specific project that may have been omitted from the list, it is still felt that Table 1-19 on page 1-54 in the DEIS presents a comprehensive list of interrelated projects.

28.14 The air quality effects of a well blowout were analyzed, and no cumulative impacts resulting from interactions with emissions from interrelated projects were identified. Accidental well blowouts would cause release of H_2S to the atmosphere until well flow control was reestablished. Emissions of other air contaminants (SO_2, NO_x etc.) would not occur from well blowouts since the blowout stream would not be combusted (see page 1-15 of the DEIS for the gas stream composition). Because the gas stream from a blowout contains no air contaminants other than H_2S, no cumulative air quality or visibility impacts are anticipated. Release of H_2S from blowouts, because of their accidental nature, would be governed under Section 19 of the Wyoming Air Quality Regulations, "Abnormal conditions and equipment malfunction", which provides an exemption from compliance with air quality standards. Thus, no exceedances of WAAQS or NAAQS are anticipated.

Significant odor impacts would be expected in the event of a well blowout; however, it is not possible to predict the areas which could be affected. The well field is approximately 26 miles long, so effects could extend from the Big Piney/Marbleton area to the LaBarge area. The exact areas affected would depend on the location of the blowout, length of time the blowout lasted, topography in the vicinity of the blowout, and meteorological conditions. Past experience with the blowout of Quasar's well shows that significant odor impacts could extend at least 1.5 miles from the well site.

The effects of the release of H_2S on the terrestrial community would be the same whether the release occurred from a well, gathering pipeline, or sour gas trunk line. These effects are discussed on page 4-28 of the DEIS. Due to the extremely low probability of a sour gas release in the vicinity of a wildlife concentration, potential impacts on wildlife are not considered significant.

28.15 The commenter has misinterpreted the stated reasons for not specifically addressing air quality impacts to the Popo Agie Primitive Area and Fitzpatrick Wilderness. It was not the intent of the EIS to imply that no impacts would occur in these areas and that plumes could not go over or around the Wind River Range. Emissions can impact the Popo Agie and Fitzpatrick, but because of the intervening terrain, such emissions would be more dispersed than plumes impacting the Bridger. As such, impacts defined for the Bridger Wilderness define the upper limit of impacts at Popo Agie and Fitzpatrick. Clarifying language has been added to the Air Resources Technical Report on this point.

28.16 Visibility impacts in Class II areas were not analyzed in the same way that potential impacts in Class I areas were analyzed. Section 169(a) of the Clean Air Act (as amended) establishes as a national goal "the prevention of any future and the remedying of any existing impairment of visibility in *mandatory Class I Federal areas*" (emphasis added). EPA has developed a methodology for the evaluation of impacts in Class I areas (see page 3-38 of the Air Resources Technical Report) but no methodology exists for such an evaluation in Class II areas. It would not be appropriate to use the Class I methodolgy in Class II areas due to the lower sensitivity of these areas. Since no visibility impairment from nearby Class I areas was predicted and since the applicants have stated that the only visible emissions from their plants would be occasional steam plumes from venting during cold weather, visibility impacts in Class II areas are also expected to be insignificant.

28.17 The visibility analysis utilized the standard EPA Level I screening analysis. This is generally recognized as a "worst-case" analytical technique for visibility. The major assumptions of the Level I technique are stated on pages 3-38 and 3-39 of the Air Resources Technical Report. These assumptions are as restrictive as those suggested by the commenter.

28.18 Alkalinity measurements for lakes sampled in the Bridger Wilderness are reported on Tables 2-17, 2-30, 2-41, and 2-53 of the Air Resources Technical Report. All are in the range of 100 micro-equivalents per liter, a value generally recognized as indicating lake sensitivity to acid deposition. In the absence of extensive alkalinity data for the numerous lakes in the Bridger Wilderness, lake selection for this study was made by the FS based on known relationships between lake sensitivity and surrounding geological formations. Lakes which would receive high input of acid deposition from the Riley Ridge Project and which would be highly sensitive to acid input were selected for study. Selection criteria are listed on Page 3-46 of the Air Resources Technical Report and represent a worst-case situation.

28.19 Calculated deposition rates at each of the three lakes studied are provided for each alternative in Tables 2-17, 2-30, 2-41, and 2-53 of the Air Resources Technical Report. The value listed in the column labelled "Incremental H^+ Input" represents the calculated acid deposition. Background deposition values are available only for National Atmospheric Deposition Program (NADP) sites at Yellowstone National Park. An NADP site has recently been established at Fremont Lake near Pinedale, but these data are not yet available. The Yellowstone data do not provide a reasonable comparision for several reasons:(1) NADP measures only wet deposition, whereas the EIS considers the sum of wet and dry depositon;(2) differences in elevation (and therefore precipitation) may limit the representativeness of the NADP data; and(3) the conservative nature of the assumptions in the acid deposition analysis is designed to overstate the expected deposition flux.

The worst-case deposition rate for total sulfur resulting from the Riley Ridge Project would occur at Clear Lake (south) under the Northern Alternative. This rate has been predicted to be approximately 0.1 $g/m^2/year$. This would be one-fifth the threshold of 0.5 $g/m^2/year$ referenced by the commenter.

28.20 Changes in lake pH resulting from acid deposition have been included in Table 2-1 of the final EIS. A discussion of the effects of pH changes on fisheries can be found beginning on page 4-46 of the DEIS. This discussion is not part of the Wildlife and Fisheries Technical report. Colorado River cutthroat trout are not found in the Bridger Wilderness, the area that could be most affected by acid deposition. Their distribution lies on the east slope of the Wyoming Range, within or adjacent to the well field. Due to the prevailing winds, this area would not be significantly affected by acid deposition. In addition, the streams and lakes in the well field are are well buffered and would not be subject to significant changes in pH. The Colorado River cutthroat has been classified as "sensitive" by the BLM and FS because of its sensitivity to competition, hybridization, fishing pressure, and habitat alternation. It is no more sensitive to pH changes than other species of trout.

28.21 No hazardous wastes have been identified for the Riley Ridge Project. (See page 1-35 of the DEIS.) This includes heavy metals and radioactive materials.

28.22 A discussion of the impacts of CO_2 emissions from the Riley Ridge Project can be found on page 4-45 of the DEIS. An analysis of CO_2 emissions from the combustion of various types of fuel is beyond the scope of this EIS.

28.23 An expanded explanation of the reason the actual off-side data is considered more representative than the assumed worst-case data has been provided in the final EIS. See the Errata Summary for page 4-42 of the DEIS for this revision.

The commenter has misunderstood the discussion in the Air Resources Technical Report (page 3-33). The year 1985 was selected as worst-case *only* for the modeling of SO_2 emissions from diesel generators in the well field. During 1985, drilling at different well sites would be in closest proximity, so combined SO_2 emissions from diesel generators would be greatest. These emissions would not be part of well operation.

28.24 The air quality modeling protocol called for the analysis of each hour of a one-year Kemmerer Coal data set using the COMPLEX I model. Since a complete year of data was input to the model, the probability that the worst-case period (for the one-year data set) was determined is 100 percent. It can certainly be argued that selection of a different one-year period could have yielded different results (either higher or lower). For this reason, multi-year on-site data records are preferred when available. In this instance, however, they were not available. Also, the commenter is in error when he implies that EPA requires all analyses be done using 5 years of data. The EPA Regional Workshops on Air Quality Modeling state "the use of five years of NWS meteorological data or at least one year of on-site data is required". The one-year Kemmerer Coal data set was judged by ERT to be more representative of on-site conditions (see Response to Comment 28.23) than NWS data available for Rock Springs, even though five years of data were available from the Rock Springs airport.

28.25 A more detailed explanation of the proper interpretation of wind roses has been provided. See Errata Summary for pages 3-32 and 3-33 of the DEIS.

28.26 In the Visual Resources section, it was deemed necessary to distinquish between different levels of significant impacts. Therefore, the term "highly significant" was chosen to identify those impacts which were the most severe and of the greatest concern. There was no intention to demean the importance of any "significant" impacts. Other terms could have been chosen but for consistency, it was felt that the term "highly significant" used in conjunction with the definitions presented on page 4-55 of the DEIS would be appropriate.

28.27 As shown in Table 4-107 on page 4-142 of the DEIS, no irreversible impacts to visual resources are expected to result from the Riley Ridge Project.

28.28 The "may affect decision" regarding the black-footed ferret is discussed on page 4-26 of the DEIS. The decision was issued by the BLM and FS in their Biological Assessment submitted to the U.S. Fish and Wildlife Service (FWS). The Biological Assessment is included in this FEIS as Appendix F. A Biological Assessment is required for compliance with the Endangered Species Act (see page 1-6 of the DEIS). The Biological Opinion issued by the FWS as a result of the consultation process will specify the mitigation measures to be carried out by the companies. The Section 7 consultation process was recently summarized in the June 29, 1983 Federal Register. Reviewing the requirements and processes of the Act are not within the scope of the EIS.

28.29 During the preparation of an EIS, technical specialists frequently contact their counterparts in federal, state, and local agencies to discuss baseline conditions within the project area and potential impacts from the project. These discussions are extremely important in supplementing published information and are documented as "personal communications". Professional judgement, whether on the part of a technical specialist on the EIS team or an agency specialist in the field, is an accepted method for analyzing impacts. Even when specific methodologies are used to assess impact, they often incorporate assumptions which are arrived at through professional judgement. The examples cited in the comment were contacts made to document baseline conditions (Chapter 3) and anticipated impacts (Chapter 4). Since no other specific deficiencies in methodology have been identified, the commenter is referred to the Riley Ridge technical reports for detailed discussions of the assumptions and professional judgement used in impact assessment.

28.30 The precipitation patterns used in the acid deposition assessment were based upon all available data in the project area. Inputs to the acid deposition model required greater resolution than was available in these data. Therefore, some interpolation of data based on professional judgement was required. At lower elevations (e.g., the area between the plant sites and Wind River Range) data from Big Piney and Pinedale were considered representative because the elevation of the data points are similar to elevations of this region. For the mountains, a different rationale was used. Precipitation was defined based on elevation, using a linear best fit curve of precipitation-elevation relationships between existing data points. This curve is depicted on page 3-49 of the Air Resources Technical Report.

The text referred to by the commenter is from a section of the Air Resources Technical Report where uncertainties in the modeling approach are discussed. For a complete discussion and justification of the precipitation inputs to the acid deposition modeling, the reader should refer to the discussion on pages 3-46 and 3-47 of the Air Resources Technical Report.

Comment Letter 29

Thomas A. Wesche
Walt H. Eifert
P.O. Box 3067
University Station
Laramie, WY 82071
July 22, 1983

Ms. Janis Van Wyhe
Bureau of Land Management
Division of EIS Services
555 Zang St., 1st Floor East
Denver, Colorado 80228

Dear Ms. Van Wyhe:

On behalf of the Colorado-Wyoming Chapter of the American Fisheries Society, we would like to take this opportunity to make the following comments regarding the Riley Ridge Draft Environmental Impact Statement:

29.1 - On pages 3-20, column 2, the statement is made that only Beaver Creek contains a pure strain population of Colorado River Cutthroat Trout. Our conversations with representatives of the Wyoming Game and Fish Department indicate that transplants of the pure strain have been made into Black Canyon Creek, Pine Grove Creek, and Fogarty Creek. Hence, we feel similar protection should be afforded these streams as well.

29.2 - We question the adequacy of the predictions made on pages 4-48 regarding the long-term effects of off-site acid deposition. The over 2,000 lakes and numerous miles of streams which drain the Bridger and Fitzpatrick Wilderness Areas and the Popo Agie Primitive Area constitute one of the most pristine and valuable aquatic resources within the continental United States. The statements made that "the long-term effects of acid deposition in the Bridger Wilderness Area cannot be estimated at this time with high confidence" and, "the long-term rate at which alkalinity is replaced is poorly understood and requires substantial study" lead us to conclude that sufficient information is not presently available to make a sound judgement on these potential impacts. Answers to these questions should be found before development begins, not after, when damage to the fishery and water resources has possibly already occurred. It is our opinion that these resources are too important to take such a gamble.

29.3 - In regard to Appendix E, Monitoring Programs, we feel that the plans for air quality, fisheries and surface water should have been included in the Draft EIS. We strongly recommend that these monitoring programs be developed before the Final EIS is released and made available for review by the public and appropriate agencies.

29.4 - The fisheries mitigation measures outlined in Appendix D are extremely negative in nature and in our opinion, are not truly mitigation measures.

29.5 - Certainly one of the most direct impacts to instream and riparian habitat will result from the 44 proposed pipeline crossings. As discussed on page 4-21, the sediment produced from this construction activity could severely reduce the quality of the fish spawning and food production areas downstream. We strongly urge that every possible measure be taken to reduce the input of sediment into these streams. Heavy equipment operation instream and streamside should be kept to an absolute minimum, backfilling should be done only with clean fill free of fines, and spoil piles should be located outside the active channel. We also urge that any degraded habitat resulting from crossing construction be reclaimed using appropriate habitat improvement techniques. This should be done in consultation with the Wyoming Game and Fish Department. Also, every effort should be made to facilitate fish passage and movement during construction.

- In conclusion, we urge close consultation with the Wyoming Game and Fish Department not only through the remainder of the EIS process, but also throughout the construction and operation phases, should the Riley Ridge Project proceed.

Thank you for this opportunity to comment.

Sincerely yours,

Thomas A. Wesche

Thomas A. Wesche

Walter H. Eifert

Walter H. Eifert

Co-Chairmen - Aquatic Issues Committee
Colorado-Wyoming Chapter
American Fisheries Society

TAW:WME:rd

cc: Mary McAfee, President
Colorado-Wyoming Chapter, AFS

Responses to Comment Letter 29

29.1 See Response to Comment 27.3.

29.2 Please refer to Responses to Comments 27.13 and 27.70.

29.3 The air quality related values, fisheries, and surface water monitoring plans are included as part of this final EIS.

29.4 The uncommitted mitigation measures for fisheries presented in Appendix D of the DEIS could be applied in response to potential indirect impacts resulting from increased fish harvest due to expected population increases. These measures could be implemented if other mitigation measures are not effective.

29.5 Thank you for your comment. These suggestions will be considered during the final decision making process. Mitigation measures for fisheries are found on pages 4-133 and 4-134 of the DEIS, and habitat protection and restoration procedures are found in Appendix B of the DEIS.

Comment Letter 30

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
1860 LINCOLN STREET
DENVER, COLORADO 80295-0699

Ref: 8PM-EA

JUL 25 1983

Ms. Janis Van Whye
Bureau of Land Management
Division of EIS Services
555 Zang Street, First Floor East
Denver, Colorado 80228

Dear Ms. Van Whye:

The Region VIII Office of the Environmental Protection Agency has completed its review of the Riley Ridge Natural Gas Project draft environmental impact statement. We have appreciated the opportunity to participate in the EIS process as a cooperating agency. The magnitude of the proposed action has required the integration of the various facilities into a complex planning process. We would like to take this opportunity to commend the Bureau of Land Management and the Forest Service on the quality of the DEIS.

Our concerns and comments are primarily related to potential impacts on water quality. More specifically, the relationship of produced water disposal to existing geologic conditions. An additional concern is associated with air quality modeling. These comments are attached.

According to our guidelines, we have rated this DEIS as ER-2. This means that we have environmental reservations regarding some aspects of the proposed action. More informtion and/or some modifications would help alleviate these concerns as our comments indicate. If you have any questions regarding EPA concerns, please contact Mike Hammer of my staff at 837-2351.

Sincerely yours,

John G. Welles
Regional Administrator

Enclosure

EPA Comments on the Riley Ridge
Natural Gas Project DEIS

Water Quality

30.1 The section on key Federal authorizing actions is incomplete. Approval to dispose of produced water also comes under the authority of the Safe Drinking Water Act, Sections 1421, 1422 and 1425. This authority is presently administered by the Wyoming Oil and Gas Commission. Disposal of waste water from the gas processing plants is also under the authority of the Safe Drinking Water Act, specifically 40 CFR 122, 123, 124 and 145. The Wyoming Department of Environmental Quality is expected to assume primary enforcement for the program in the next two months. Consequently, wells which inject both produced brines and waste from the gas plant will probably need a permit from both the Wyoming Oil and Gas Commission and the Wyoming Department of Environmental Quality.

30.2 Potential groundwater impacts, page 4-36, from construction of injection wells at plant sites should be changed. The Safe Drinking Water Act requires that injection wells be cased and cemented to prevent impacts to all aquifers containing less than 10,000 mg/l total dissolved solids. In addition there appears to be a lack of data on existing water quality and water use of various aquifers which overlie any prospective injections zones. Some of this data should be available from existing exploration data.

30.3 Potential impacts on groundwater from the operation of injection wells should be expanded. Injection well regulations of both the WOGC and the WDEQ include limitations on injection pressures. It will be necessary for data to be collected relating to Formation Fracture gradient so that the injection well can be properly designed. Injection pressure must be limited so they do not exceed the fracture gradient thereby resulting in the confining horizon being fractured during operation. This could allow movement of fluids into an underground source of drinking water.

30.4 Additional discussion of water quality of the produced water to be reinjected is needed. Other information that is lacking is an estimate of the volume of produced water and the proposed number of disposal wells.

30.5 There needs to be a more detailed discussion of the alternatives for collection and disposal of produced water. This should include injection within the field, pipeline collection and disposal at a single site, road haulage and disposal at a single site, etc. In addition, the available exploratory data should be used to provide a brief analysis of potential disposal horizons and their approximate water quality.

30.6 The draft EIS does not adequately address the impacts that construction of wells would have on nearby streams. Potential impacts of sediment on surface water and control methods deserve additional analysis.

30.7 Appendix E needs to include the following monitoring program considerations.

1. All injection wells should have cement band logs to insure that fresh water aquifers are protected from upward movement of wastewater through channels outside the casing.

2. Disposal wells at the plant site need a continuous monitoring program for injection volume and annulus pressure.

Air Quality

30.8 Our review of the air quality section did not surface major deficiencies in the analysis, yet some modeling procedures need further detail. There was no reference to the model or models used in the Class II complex terrain analyses or long range transport to the Class I areas. A description of how the Class I receptors were chosen is needed. In addition, a clarification of critical Class I receptors for all four different plant location scenarios is desired. It was not clear if each proposed plant site was collecting on-site surface meteorological data to be used in the final PSD analysis.

30.9 The EIS failed to address the modeling assumptions in the analysis of the non-buoyant COS plumes. Although the EIS addresses acid deposition into snow and the surge in pH change, due to the spring snow melt, it does not address the true buffering capacity of the potentially affected lake beds. Also, not addressed is what the continuous affect of year after year of acid deposition will have on the leaching of minerals and heavy metals from lakes and stream beds.

One other important consideration should be noted. Since the preliminary modeling shows potential violations of the Class II 24 hour SO_2 PSD increment and the H_2S standards, it is assumed that additional controls will be needed to reduce these emissions. These additional control technologies will change the plume temperature, velocity, height and dispersion characteristics. Therefore, after these controls are designed the air quality impacts may differ significantly in concentration and location from the present analysis.

Responses to Comment Letter 30

30.1 The two references have been added to the authorizing actions section. See Errata Summary for page 1-7 of the DEIS.

30.2 3The text has been changed to reflect 10,000 milligrams/liter TDS. See the Errata Summary for page 4-36 of the DEIS. Some groundwater quality samples have been recently analyzed and the results provided to the BLM, FS, and applicants. Data from exploration programs are not available.

30.3 Data collection pertaining to fracture gradient and other parameters will be necessary for permitting purposes. Without data on the locations of wells, hydraulic operating characteristics, and formation parameters, impacts of injection wells cannot be more thoroughly discussed. The conclusions of this comment are and would be covered by Wyoming Department of Environmental Quality and Wyoming Oil and Gas Conservation Commission regulations as stated in the DEIS on pages 4-36 and 4-37.

30.4 The water quality and volume of produced water is described on Table 1-21 on page 1-58 in the DEIS. The number of reinjection wells required has not been determined at this time and can not be estimated until more data on receiving aquifers is obtained.

30.5 All of these alternatives have been proposed by one or more of the applicants and are described on page 1-36 of the DEIS and in the Proposed Action Technical Report. However, the most important consideration is not how the produced water would be transported to the injection wells (e.g., pipeline or truck), but the operation of the wells as a means of disposal. It is acknowledged that a more detailed description and analysis of the injection wells is desirable, but this has been identified as a data gap that would need to be filled before permits are granted by Wyoming Department of Environmental Quality and Wyoming Oil and Gas Conservation Commission (see Mitigation Measures W-1 and W-2 on page 4-135 of the DEIS). Exploratory data beyond that referenced in the DEIS is not available.

30.6 The impacts of sedimentation on streams are discussed on page 4-35 of the DEIS. Without further detail on the perceived deficiencies of this analysis, it is not possible to expand the discussion. Erosion and sediment control measures are discussed in detail in Appendix B of the DEIS, especially in Appendix B.7.

30.7 Agreed. These program considerations have been added to Appendix E. See Errata Summary for page E-1 of the DEIS.

30.8 A detailed explanation of all issues (models, receptors, etc.) is contained in the Air Resources Technical Report (pages 3-28 through 3-31). On-site monitoring programs are being conducted at West Dry Basin, East Dry Basin, and Craven Creek.

30.9 COS plumes were originally designed to be nonbuoyant, but were reengineered by Exxon and Northwest Pipeline to increase their buoyancy and reduce their impacts. The modeling approach used for COS sources is described on page 3-36 of the Air Resources Technical Report. With regard to acid deposition, the true buffering capacity of the watersheds studied is not known at this time. Therefore, acid deposition impacts were assessed using a range of possible buffering capacities. One end of the range represents 50 percent neutralization (a mid-range), while the other end represents no neutralization (worst-case). As stated on page 4-48 of the DEIS, long-term acid deposition effects cannot be quantified until more is known regarding replacement of lost alkalinity and other important issues.

Comment Letter 31

AMERICAN QUASAR PETROLEUM CO.

2500 FORT WORTH NATIONAL BANK BUILDING / FORT WORTH / TEXAS 76102, U.S.A.

Telephone (817) 335-4701

July 11, 1983

Janis VanWyhe
Bureau of Land Management
Environmental Impact Statement Office
Third Floor East
555 Zang Street
Denver, CO 80228

Dear Janis:

This has reference to the Draft Environmental Impact Statement on the Riley Ridge project dated May 20, 1983 and contains our comments as to the adequacy of the document.

1. We believe that the document is an adequate representation of a "worst case analysis" of the project.

31.1 2. There are many references throughout the document to the fact that American Quasar plant would (emphasis added) exceed both SO_2 and H_2S emmission limits. This is a patently false statement for the following reasons - all of which have been discussed with your office and ERT on numerous occasions:

a. The computer modelling used meteorological data from areas from 75-100 miles away from the proposed site. On site data (now being collected), may produce different results.

b. Only preliminary engineering and design work on the plant has been done and no optimization has been attempted. Upon completion of this work, the emmissions from the plant will be within acceptable limits.

c. A permit to construct from WDEQ could not be obtained if the emmissions exceeded statuatory limits.

3. Throughout the document the indicative mood was used when the subjunctive mood should have been used.

31.2 4. Analysis of the Agencies "preferred alternative" (Shute Creek Alternative) indicates that there would be no essential difference if Quasar's plant was located at Buckhorn or East Dry Basin. Even though this case was not studied (Quasar at East Dry Basin in the Shute Creek Alternative), which we protested, the results show that the predominance of the few

31.2 (cont.) adverse impacts contributed by our plant at Buckhorn are caused by additional lengths of trunk lines and the crossing of the Green River. We therefore believe that the preferred alternative should provide for our plant being located at either location.

31.3 5. Page 4-39, left column, item 5. EIS arbitrarily assumes H_2S of 6.5 micrograms/cubic meter - a value less than WDEQ standards. Subsequent conclusion is that odor impacts are significant.

31.4 6. Several references are made to "buoyancy of Quasar plumes", with the reference that our plumes were not as bouyant as the other plants. In all data furnished to, and verified by, ERT our plume bouyancy equaled or exceeded that of the other plants.

31.5 7. We do not believe that the comments regarding marketing of CO_2, or the payment of compensatory royalty in lieu thereof, have a place in the EIS. In no other section of the EIS is any weight given to commercial factors and we, therefore, feel it inappropos to bring it in in this regard.

Sincerely,

Gordon L. Cornell
Vice President

GLC/p

Responses to Comment Letter 31

31.1 Your comment is correct on all points; however, given the preliminary design information and off-site meteorology, modeling results showed that an exceedance would occur. It was necessary to identify this exceedance in the DEIS. Section 2 of the final EIS has been modified to clarify that Quasar's plant would comply with all applicable air quality standards.

31.2 Your comment will be considered in the final decision making process.

31.3 See Response to Comment 23.28.

31.4 Based on engineering data submitted in the original right-of-way applications, COS and H_2S plumes designed by American Quasar were determined to be more buoyant than comparable plumes from Exxon or Northwest. However, engineering revisions were made during the course of the study to reduce the predicted H_2S and COS impacts from Exxon and Northwest emissions. When comparing the Quasar plumes to the revised Exxon and Northwest plumes, Quasar plumes from the Selexol CO_2 vent and N_2 vent are less buoyant.

31.5 Please refer to Response to Comments 21.9, 21.10, and 21.12.

Comment Letter 32

United States
Department of
Agriculture

Soil
Conservation
Service

P.O. Box 2440
Casper, Wyoming
82602

July 21, 1983

Janis VanWyke
Riley Ridge Project Leader
Bureau of Land Management
Division of Environmental Impact
Statement Services
First Floor, East
555 Zing Street
Denver, Colorado 80228

Dear Mrs. VanWyke:

The Soil Conservation Service in Wyoming has reviewed the draft EIS on the proposed Riley Ridge sour gas development project in Wyoming and has the following comments.

1. The EIS accurately reflects the impacts of the proposed development and alternatives on the soil, water, vegetation, and agriculture in Sublette Co. and the surrounding area. The project area is mostly on federal land and contains no prime farmland.

2. The EIS contains extensive information on the acres that will be disturbed and requires reclamation under the various alternatives. Good erosion control, revegetation, and restoration guidelines are included, and "rehabilitation units" have been identified based on general soil types. The report doesn't include a detailed soil map of the area; however, this information is available in a special Soils, Vegetation, and Reclamation Technical Report. Because of the extent of this project, detailed soils maps will be essential for good planning before construction and reclamation afterwards.

3. The report recognizes that sensitive rehabilitation units are present in areas that are highly saline/alkaline, steep, etc. Soils maps should help in identifying these areas and hopefully avoiding them when possible.

4. The suggested rehabilitation techniques listed are good, but necessarily broad. Because of the great variety in soils, moisture, slopes, and climatic conditions, great care will be needed in developing seed mixtures and using reclamation techniques that are locally adapted and site specific. A single seed mixture, for example, probably couldn't be used on the whole length of a pipeline right-of-way.

The Soil Conservation Service
is an agency of the
Department of Agriculture

Janis VanWyke
Page 2
July 21, 1983

32.1 5. One impact on the soils, water, and vegetation that wasn't addressed very well in the report was the increase in rural subdivisions as a result of population influx. Past projects in Sweetwater Co. led to extensive subdividing in Sublette Co. for both year-round and second homes. Many of these subdivisions were on unsuitable soils, in flood plains, had poor access, etc. Proper planning at the county level will be required to avoid this type of problem in the future.

We appreciate the opportunity to provide comments on this proposal.

Sincerely,

Frank S. Dickson
State Conservationist

cc: Peter C. Myers, Chief, Soil Conservation Service, Washington, D.C.

Response to Comment Letter 32

32.1 The DEIS addresses potential impacts resulting from the Riley Ridge Project including the likelihood of a housing shortage in the study area. With increased housing demand, there would likely be an increase in subdivision development as indicated in your comment. It will be the responsbility of local planning boards to limit the siting of new subdivisions to areas of suitable soils, access, etc.

Comment Letter 33

United States Department of the Interior

BUREAU OF MINES

P. O. BOX 25086

BUILDING 20, DENVER FEDERAL CENTER

DENVER, COLORADO 80225

Intermountain Field Operations Center

July 26, 1983

Memorandum

To: Mrs. Janis Von Wyke, Riley Ridge Project Leader, Bureau of Land Management, Division of Environmental Impact Statement Services, 555 Zang Street, Denver, Colorado 80228

From: Acting Chief, Intermountain Field Operations Center

Subject: Review of draft environmental impact statement for Riley Ridge Natural Gas Project, Wyoming

Our Washington, D.C., office requested that we review the subject statement and provide field-level comments about involvement of mineral resources, operations, and facilities.

The statement analyzes the environmental effects of proposed development of a 160,000-acre natural gas field and related gas treatment plants and other ancillary facilities in Sublette, Lincoln, and Sweetwater Counties, Wyoming.

The Bureau of Mines is especially interested in any impact of the proposed project on mineral resources and mineral supply. Obviously, production of hydrocarbons and sulfur, as proposed, would add significantly to domestic supply of these resources (p. 1-3). Apparently an irretrievable commitment
33.1 of the helium and carbon dioxide in the natural gas would occur, but this is not mentioned in the statement (p. 4-141 or Table 4-107).

We are concerned about the conservation of helium and carbon dioxide, Federally owned mineral resources that are associated with the low-BTU natural gas at Riley Ridge, for which there is no commitment for recovery at this time.

Helium in the Riley Ridge Gasfield is among the principal domestic resources of this rare gas. Although production from domestic gasfields is adequate to meet present consumption and export demand, new sources of helium probably will be required after 2000 to meet projected demand. At that time, Riley Ridge may be the prime resource of helium-rich (more than 0.3% helium) natural gas in the nation.

33.2 We believe that the note about disposition of helium in the Summary (p. X) makes it appear as though the Bureau of Mines and Department of the Interior are not concerned about helium recovery or conservation. We believe that such an impression is incorrect and that portions of the environmental statement about helium, and carbon dioxide, should show clearly that we are concerned about conservation of these Federally owned resources. Although a final determination has not been made regarding helium disposition, the Bureau of Mines is aware of the significant helium resource at Riley Ridge and is monitoring the situation to ensure that this valuable resource is conserved.

In all other respects, the statement seems to be a comprehensive, well prepared analysis of the Riley Ridge project.

Jimmie E. Jinks

cc: Regional Environmental Officer,
Missouri Basin Region, Denver, Colo.

Responses to Comment Letter 33

33.1 Please refer to the Errata Summary for revision to page 4-147 (Table 4-107) of the DEIS.

33.2 Refer to page 1-6 of the DEIS and the Errata Summary for page 4-142 of the DEIS. The Bureau of Mines' concern for the conservation and prevention of waste for helium is recognized. The statement on page x of the DEIS simply indicates that no determination on helium status for this particular project has been made.

Comment Letter 34

WYOMING WILDLIFE FEDERATION

Box 333
Cheyenne, WY 82003

August 2, 1983

Bureau of Land Management
555 Zang Street
1st Floor East
Denver, CO 80228

Attention: Brian Shark

Dear Mr. Shark:

SUBJECT: Riley Ridge Oil & Gas Project Testimony

The Wyoming Wildlife Federation (WWF), the state's oldest and largest conservation organization with a membership of approximately 1% of the state's population, respectfully submits the following comments on the proposed Riley Ridge Oil and Gas Project.

We are pleased that the BLM has recognized this project as one having significant impact to the human environment and are therefore preparing an environmental impact statement for the project.

According to the Draft Wildlife Technical Report for the Riley Ridge EIS, "The Riley Ridge Project area is rich in wildlife resources. Varying topography, elevation, precipitation, soils, and associated plant communities support a diverse wildlife community composed of species typical of coniferous and aspen forests, sagebrush steppe, mountain shrub and bunchgrass slopes, greasewood and saltbush flats, agricultural pasture and hayfields, riparian zones of wet meadow, willow, and cottonwood types, and aquatic habitats varying from small mountain streams to beaver ponds, stock ponds, small reservoirs, larger streams, and a major river system and reservoir.

"The area is well known for its diversity of big game and is an important recreation area for sport hunting. Managing wildlife habitat has been and continues to be a major objective of the Wyoming Game and Fish Department (WGF), Bridger-Teton National Forest of the U.S. Forest Service (FS), and Bureau of Land Management (BLM). Populations of elk, moose, mule deer, and pronghorn are all hunted in the area, and the continued welfare of these species has been identified as a significant issue related to oil and gas development. Bighorn sheep have been reintroduced in a portion of the proposed well field and propagation of that population and maintenance of its habitat is also an important issue. Other trophy game include black bear and mountain lion.

Wyoming Outdoor Sportsmen dedicated to Wildlife Conservation and Preservation.

"Four species of federally protected endangered status have been reported to occur in the study area: bald eagle, whooping crane, black-footed ferret, and peregrine falcon. Sage grouse, blue grouse, ruffed grouse, chukar, and mourning dove are the area's upland game birds. Important waterfowl include Canada goose, mallard, and blue-winged teal. Small game mammals are the cottontail, snowshoe hare, and red squirrel. Other groups of interest are raptors, particularly the golden eagle, and birds such as the sandhill crane and long-billed curlew."

The Riley Ridge Area has also been and is becoming moreso, an important energy producing area. If Wyoming's Number 1 (oil and gas) and Number 2 (tourism) economic industries are going to remain compatible in this area, the mistakes of the past, much smaller oil and gas developments (Figure 1), cannot be repeated. To the greatest extent technically feasible, the impacts of this mammoth project must be mitigated if this part of Wyoming is to maintain its diverse and healthy environment and wildlife populations.

The WWF has developed a list of mitigation methods that if implemented by federal agencies, companies involved in the proposed action, interested organizations, and individuals should enable the Riley Ridge Area to continue to provide for the economic and esthetic values that it currently is known to possess.

Specifically these mitigation methods by categories are as follows:

A. Air Quality

The Riley Ridge Area, as is the case with most of Wyoming, currently enjoys the health, economic and esthetic values that a clean air resource provides. The WWF feels strongly that no facility should be built that
34.1 would violate Wyoming state air quality standards.

34.2 Recent conversations with University of Wyoming engineering professors have revealed that state-of-the-art sulfur removal equipment and processes can virtually eliminate sulfur emissions from stack gasses. State-of-the art techniques and processes should be used at all facilities.

34.3 Air quality must receive serious attention particularly since H_2S will be emitted by processing plants and other locations and facilities. H_2S has in recent years killed or seriously injured both people and wildlife in southwestern Wyoming. Both H_2S and SO_2 can become precursors to acid precipitation. Several of Wyoming's wilderness areas and mountain ranges occur downwind from the Riley Ridge Project. These mountainous areas harbor thousands of lakes and streams, many of which are currently poorly buffered. Acid precipitation could destroy the important fishing that exists in these lakes and streams. Lakes and streams in the Bridger Wilderness Area may be particularly vulnerable.

B. Water Quality

Water quality in the Riley Ridge Area is generally good. Soils, however, are in some areas extremely erodable and past land abuses from timbering, livestock grazing, recreational pursuits, and oil and gas activity have caused increasing silt boading in some streams.

Documentation exists evidencing that silt loads so great in the Riley Ridge Area caused beaver ponds to be completely silted in after only one year from the time built (Figure 2).

In this case, roads and drill pads from oil and gas development were the major cause of the increased silt load. The stream (Fogarty Creek) shown in Figure 2 had previous to that time, supported a population of Colorado River cutthroat trout. No trout were found in the stream at the time the photograph was taken.

34.4 Proper design of roads and well pads can greatly aid water quality. (Figure 3) Other mitigation measures such as reclamation of road shoulders, unused portions of drill pads, construction laydown areas and other unused disturbances can also help decrease silt loads. Silt catchers placed at strategic sites and livestock exclosures placed on steep slopes and riparian areas can also greatly aid water quality.

34.5 Evaporation ponds filled with toxic chemicals should only be allowed after acceptable final reclamation plans have been approved. Ponds should be fenced to prevent livestock and wildlife from drinking at the ponds. The ponds should also be covered with screens to prevent use by waterfowl and other birds such as whooping cranes. Scare devices may also be useful in preventing wildlife use.

34.6 Injection of the toxic waste water into deep wells may provide a viable alternative to evaporation ponds.

C. Land Quality

Direct land disturbance will amount to over 12,000 acres. Indirect disturbances will result in several times the figure listed above being lessened in value or eliminated as wildlife habitat particularly for big game species. Several unique or restricted habitats occur in the project area (riparian, mountain shrub, forested areas, and Wyoming Game and Fish Department classified critical wildlife habitats). Disturbance of these areas should be kept to a minimum. Several potential ways of reducing disturbance to unique, restricted, and critical habitats exist.

34.7 1. Relocation of the sulfur loadout facility to an area not so critical to wildlife.

34.8 2. Several of the proposed plant site locations are in critical winter, summer, or pasturation ranges. It appears, at least in some cases, that the selected locations have a great deal to do with dispersion

34.8 (cont.) of air pollution. If state-of-the-art air pollution devices are used, the need to locate plant sites on the tops of high ridges or other topographic features will probably be eliminated. Areas not critical to wildlife survival should be examined for plant site locations.

34.9 3. The proposed action calls for more than 300 miles of roads to transverse ultimately the project area. This will put over 91% of the project area in the influence zone (0.9 mil) of roads. Big game and especially elk will only infrequently utilize this zone of influence so this habitat is effectively lost. The 300 mile figure seems excessive. Road distribution to well pads and other facilities should be designed so as to minimize the number of miles of roads in the project area. Roads should also be designed as much as possible to avoid critical wildlife ranges particularly winter and pasturation ranges. Winter feed grounds should also be avoided.

34.10 4. On pages 2-22 of the Draft Wildlife Technical Report for the Riley Ridge EIS prepared by ERT is found a discussion of Exxon's multi-well directional drilling option. This discussion was somehow misplaced and is not contained in the final report as is the case with several other potential mitigation measures and resource conflicts associated with the project. This option would likely have the single largest positive effect of any potential mitigation measure. For example, implementation of the directional drilling option on only Exxon's holdings would result in locating 11 well pads on elk critical winter range as compared to 21 under the proposed action. Only 9 well pads would be located on elk calving grounds as compared to 27 under the proposed action. This option would result in significantly less habitat disturbance (1,930 acres vs. 2,660 acres) and 21 fewer miles of roads. This option would also result in a substantial cost savings to the involved companies. This option should receive top priority for implementation by all the companies involved in this project.

34.11 5. Exxon's railroad spur would disturb several categories of important wildlife habitat. The railroad would also interfer with management goals adopted by Seedskeedee National Wildlife Refuge. The potential exists for train related deaths to wildlife. The WWF, therefore, suggests that the railroad spur be replaced by a molten sulfur pipeline.

34.12 6. Common transportation corridors should be utilized by all companies wherever possible.

7. American Quasar's suggestion of utilizing underground power lines buried in road shoulders should be complimented. This will reduce

wildlife conflicts particularly to birds. A whooping crane was recently killed in southwest Wyoming as a result of a collision with a power line. Underground lines would eliminate this problem.
34.13 Aboveground lines can be mitigated through proper design and by placing nesting structures of important species along the power line.

34.14 8. An area wide road use plan should be developed by BLM and USFS which would allow for seasonal restrictions including closure.

34.15 9. Since over 91% of the project area will be within zone of influence area of roads, all areas of cover and roadless areas should be meticulously protected from further disturbance. Timbering operations within and adjacent to the project area should be halted altogether.

34.16 D. Fishery
The Riley Ridge Area regionally known for its excellent fishing also harbors one of only three enclaves of the rare Colorado River cutthroat trout. Important fisheries and all Colorado River cutthroat trout streams should be carefully protected from additional siltation or chemical pollution. Gabions placed in selected streams would aid Colorado River Cutthroat trout populations. Adequate instream flows should be determined for all important fisheries and Colorado River cutthroat trout streams. Minimum instream flows should be maintained by area water users.

E. Wildlife
Most of the concerns and mitigation for wildlife have been addressed in other sections; however, a few additional mitigation measures should be listed here.

34.17 1. Since a high percentage of critical wildlife winter range will be destroyed or taken from use, additional feedgrounds may need to be created in order for wildlife to survive. Additional hay may be needed on existing feedgrounds due to additional animals utilizing these feedgrounds. The involved companies should aid the Wyoming Game and Fish Department in funding for wildlife feeding needs.

34.18 2. All potential black footed ferret habitat should be inventoried using new methods developed by the research team in Meetetsee prior to disturbance.

34.19 3. To avoid unnecessary conflicts and competition with wildlife, all feral horses inhabiting the area should be removed from the range.

34.20 4. Wildlife habitat within and outside the project area can be improved. Areas in the southeastern portion of the well field and to the south

34.20 (cont.) and east of the project area are especially conducive to habitat enhancement/improvement practices. Past developments have unnecessarily disturbed wildlife habitat (Figure 4). Unnecessary roads in this area can be closed and reclaimed. Unnecessary well pads and other facilities or portions of the above could also be reclaimed. A great potential for decadent aspen stands to be rejuvenated exists in the project area by burning or selective cutting.

34.21 5. Speed limits can be imposed to help cut down auto/wildlife related accidents. Speed limits would be particularly useful during early morning, late evening, and night hours.

F. Social Concerns

The size of this project will cause a great deal of impact from the large number of new residents moving into our state. Several mitigation measures can, however, be followed to reduce impacts to Wyoming's environment and current residents.

34.22 1. The WWF strongly recommends that Wyoming residents be hired rather than bring in people from other states who havenot developed an appreciation of Wyoming's unique lifestyle and environment.

34.23 2. Construction of so-called "man camps" within or near the project area should not be considered. Employees and their families should be housed in nearby towns and cities where they can become respectable and productive citizens. Man camps will encourage poaching, wildlife harrassment, and off-road vehicle use since entertainment and social life in this type of setting will be limited.

The city father of Kemmerer have publicly stated that they would gladly take in all project employees. They have also supported the Shute Creek Alternative as the WWF has.

34.24 3. Employees should be transported to the project site by bus just as the trona industry in Sweetwater County does. This will greatly reduce wildlife harrassment and poaching.

34.25 4. Employees and contractors should be automatically terminated for conviction of a game or fish violation.

34.26 5. An environmental awareness training program similar to that developed by the OIA in the Evanston area should be developed and periodically presented to all employees and contractors. The program should include environmental ethics, ways to avoid harrassment of wildlife, Wyoming's delicate and diverse environment, and game and fish laws.

34.27 6. To reduce poaching, additional Game Warden positions should be funded by the companies throughout the life of the project.

34.28 7. Offroad vehicle use by employees should be strictly prohibited. Oversnow vehicle use for well field maintenance should be restricted to designated routes to reduce stress on wintering wildlife.

Thank you for the opportunity to present this testimony on behalf of the Wyoming Wildlife Federation.

Sincerely,

Tom Dougherty

Tom Dougherty, Chairman
Natural Resources Action Committee
Wyoming Wildlife Federation

cas

cc: Brent Bergen, President
Wyoming Wildlife Federation

Figures 1,2.3.4, are in the official EIS file.

Responses to Comment Letter 34

34.1 All facilities would comply with all applicable air quality standards.

34.2 State-of-the-art sulfur control technology has been proposed by all applicants. Control efficiencies would range between 99.4 percent and 99.8 percent. Refer to the Air Resources Technical Report for further information on emissions control.

34.3 The health and safety effects of H_2S are discussed beginning on page 4-30 of the DEIS and in the Health and Safety Technical Report, while the effects of acid deposition are discussed beginning on page 4-45 of the DEIS and in the Air Resources Technical Report.

34.4 Thank you for your comment. Many of these suggestions are included in the Roading Guidelines (B.6) and Erosion Control Guidelines (B.7) found in Appendix B of the DEIS.

34.5 Detailed reclamation plans for evaporation ponds would be developed as part of the applicants' construction and use (CU) plans. The ponds would be fenced as described in Mitigation Measure WF-6 on page 4-132 of the DEIS. Screening the ponds is discussed in Response to Comment 22.8. Scare devices are also discussed in Mitigation Measure WF-6.

34.6 Alternatives to evaporation ponds are discussed in Reponse to Comments 26.5, 26.6, and 26.15.

34.7 The sulfur loadout would not be located in critical big game range (see Maps 3-2 and 3-3 in the DEIS). Also see Exxon's Comment 23.8 for further clarification on the location of the sulfur loadout.

34.8 As stated in Response to Comment 34.2, state-of-the-art emission controls have been proposed by the applicants. The West Dry Basin, Buckhorn, and Shute Creek plant sites are all located outside of critical big game range.

34.9 Of the 300 miles of roads in the project area, 222 miles, or 77 percent are existing roads. Throughout the well field, habitat effectiveness for elk (using FS prescribed methods) would be reduced by 17 percent; see page 4-19 of the DEIS and the Wildlife and Fisheries Technical Report. Minimizing new road construction in the project area is a major goal of both the FS and BLM. The proposed network has been designed to use existing roads as much as possible. The proposed network has also been modified several times to limit impacts on wildlife, including impacts related to feed grounds, human disturbance, and poaching. Final road alignments can not be determined until final well pads are located. These roads and well pads would be subject to separate right-of-way permits and environmental analysis by the FS and BLM including an evaluation of potential impacts to wildlife.

34.10 Please refer to page 1-52 in the DEIS for a discussion of multiwell directional drilling.

34.11 Thank you for your comment. It will be considered in the final decision making process.

34.12 As proposed by the applicants, several facilities, such as the sales gas and CO_2 pipelines, utilize common transportation corridors. The BLM and FS endorse the use of common corridors and will continue to encourage their use by the applicants whenever practical.

34.13 All electrical distribution lines would be of raptor-proof design. Placing nesting structures on towers would have to be approved by Utah Power and Light and BLM; items of concern would be the electrical reliability of the line and possible harassment of the nesting birds.

34.14 The BLM and FS would be responsible for regulating the use of access roads within the well field and ensuring that the Roading Guidelines (Appendix B.6 in the DEIS) are followed.

34.15 The BLM and FS would evaluate their timber management programs in light of the development associated with the Riley Ridge Project. Closing areas to future cutting could be one management option.

34.16 Sedimentation and chemical pollution protection measures are presented in Appendix B of the DEIS. Significant impacts on instream flows are not anticipated as a result of the Riley Ridge Project. Recommended instream flows for various streams within the well field can be found in Appendix B of the Wildlife and Fisheries Technical Report.

34.17 Please refer to Response to Comment 23.20.

34.18 Please refer to Response to Comment 22.11.

34.19 The BLM is responsible for managing wild horses on public lands. Any removal of wild horses would have to be done within the constraints of BLM management plans and the Wild Horses and Burros Act.

34.20 Road and well pad reclamation are discussed in Appendix B of the DEIS. Wildlife habitat rehabilitation is discussed in Mitigation Measure WF-5 on page 4-132 of the DEIS.

34.21 Speed limits have been presented as an uncommitted mitigation measure on page D-2 of the DEIS.

34.22 Thank you for your comment. This suggestion is beyond the authority of the BLM and FS but may be considered by the Wyoming Industrial Siting Administration in its permitting process.

34.23 Thank you for your comment. It will be considered in the final decision making process.

34.24 Ride-sharing programs have been presented as an uncommitted mitigation measure on page D-3 of the DEIS.

34.25 This suggestion has been presented as an uncommitted mitigation measure on page D-2 of the DEIS.

34.26 An Environmental Awareness Program has been presented as an uncommitted mitigation measure on page D-2 of the DEIS.

34.27 Additional game wardens have been presented as an uncommitted mitigation measure on page D-2 of the DEIS. This suggestion may be considered by the Wyoming Industrial Siting Administration.

34.28 Off-road vehicle use would be managed and regulations enforced by the BLM and FS. Snowmobile use for well field maintenance would also be included.

Comment Letter 35

C

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
650 CAPITOL MALL
SACRAMENTO, CALIFORNIA 95814

REPLY TO
ATTENTION OF

July 29, 1983

Regulatory Section

Mrs. Janis Van Wyhe
Riley Ridge Project Leader
Bureau of Land Management, Division of Environmental
Statement Services
555 Zang Street, First Floor, East
Denver, Colorado 80228:

Dear Mrs. Van Wyhe:

This letter is in replies to your letter of May 20, 1983 requesting comments on the Riley Ridge Natural Gas Project Draft EIS. The project area is within the Sacramento District, accordingly the correspondence has been referred to this office for reply. Our comments are outlined below.

1. Project would not impact on any Corps of Engineer flood control project or investigations. Further, adequate consideration has been given to citing the major facilities outside of flood plains in accordance with National policy outlined on Executive Order 11988. An exception would be the proposed construction of a portion of the sulfur loadout facility within the 100-year flood plain of the Hams Fork. However, it appears that this construction would not cause excessive constriction of flood flows or rise in flood stage.

35.1 2. Page 1-6. The citation for Section 404 is obsolete. It should include a reference to Nationwide and general permits. We have no Section 10 or navigable waters in the project area.

35.2 3. In general, there are numerous references to the number of riparian acres impacted by proposal and alternatives. The information is not detailed enough to determine the nature of the impact or if these riparian areas are indeed wetlands under Corps' jursidiction. The EIS may not need this information for a project of this scope, but we will certainly need the information for each individual permit application. Certain project segments (sulfur loadout facility and some of the well field work and roads) would require an individual Department of Army permit.

35.3 3. Page 4-133. Wildlife and fisheries Mitigation Measures WF-9 and WF-10 should probably include the best management practices listed in our Nationwide permit, for example equipment on pads in wetlands. A copy of the best management practices is enclosed. We also suggest that BLM examine the creation or enhancement of wetlands as a form of mitigation because of the wetlands value relative to their aereal abundance.

35.4 4. Page D-1. Mitigation of wetland losses through creations and/or enhancement would expedite processing of the Section 404 permit. We can provide assistance in developing mitigation plans on request.

If you have any questions regarding these comments please call Mr. Tom Skordal of our Regulatory Office in Salt Lake City, FTS 588-6015. Thank you for the opportunity to review the draft EIS.

Sincerely,

D. A. Dennis
Chief, Construction-Operations
Division

Enclosure

INFORMATION SHEET
CONDITIONS APPLICABLE TO NATIONWIDE
GENERAL PERMITS

A nationwide permit is a form of general permit, issued by the Department of the Army, that authorizes specific categories of activities throughout the nation. No permit application is required for an activity covered by a nationwide permit.

The following special conditions must be followed in order for the nationwide permits to be valid:

(1) That any discharge of dredged or fill material will not occur in the proximity of a public water supply intake;

(2) That any discharge of dredged or fill material will not occur in areas of concentrated shellfish production unless the discharge is directly related to a shellfish harvesting activity authorized by paragraph (a)(4) of this section.

(3) That the activity will not jeopardize a threatened or endangered species as identified under the Endangered Species Act, or destroy or adversely modify the critical habitat of such species. In the case of Federal agencies, it is the agency's responsibility to review its activities to determine if the action "may affect" any listed species or critical habitat. If so, the Federal agency must consult with the Fish and Wildlife Service and/or National Marine Fisheries Service;

(4) That the activity will not significantly disrupt the movement of those species of aquatic life indigenous to the waterbody (unless the primary purpose of the fill is to impound water);

(5) That any discharge of dredged or fill material will consist of suitable material free from toxic pollutants in toxic amounts;

(6) That any structure or fill authorized will be properly maintained;

(7) That the activity will not occur in a component of the National Wild and Scenic River System; and

(8) That the activity will not cause an unacceptable interference with navigation.

In addition to the conditions specified above, the following should be followed, to the maximum extent practicable, in the discharge of dredged or fill material under nationwide permits in order to minimize the adverse effects of these discharges on the aquatic environment. Failure to comply with these practices may be cause for the district engineer to recommend that the division engineer take discretionary authority to

regulate the activity on an individual basis:

(1) Discharges of dredged or fill material into waters of the United States shall be avoided or minimized through the use of other practical alternatives.

(2) Discharges in spawning areas during spawning seasons shall be avoided.

(3) Discharges shall not restrict or impede the movement of aquatic species indigenous to the waters or the passage of normal or expected high flows or cause the relocation of the water (unless the primary purpose of the fill is to impound waters).

(4) If the discharge in wetlands creates an impoundment of water, adverse impacts on the aquatic system caused by the accelerated passage of water and/or the restriction of its flow, shall be minimized.

(5) Discharge in wetlands areas shall be avoided.

(6) Heavy equipment working in wetlands shall be placed on mats.

(7) Discharges into breeding areas for migratory waterfowl shall be avoided.

(8) All temporary fills shall be removed in their entirety.

If the above conditions cannot be met, the work will have to be authorized by an individual or general permit issued by the district engineer.

If you have any questions or need additional information concerning the nationwide general permit, please contact our Regulatory Section, at Room ____, or telephone _____.

RECEIVED

AUG 5 1983

EIS OFFICE

Responses to Comment Letter 35

35.1 The text has been corrected. See the Errata Summary for revision to page 1-6 of the DEIS.

35.2 This is correct. The EIS does not show in detail where the riparian acres are, but as the right-of-way grants are finalized, the construction and operation plan will indicate exact locations.

35.3 Stream crossings and well pads will, if at all possible, be located outside of "wetlands", however, your guidelines will be used where they cannot be avoided when the final rights-of-way are granted.

35.4 Thank you for the information. Your assistance in processing Section 404 permits will be appreciated.

PUBLIC HEARING COMMENTS - PINEDALE, JUNE 27, 1983

Comment 36.1:

Mr. Len Edgerly, Assistant Director, Wyoming Heritage Society, expressed concerned that the DEIS did not adequately represent the benefits that the Riley Ridge Project would bring to the area and state in increased jobs and tax revenue. There is no prediction in the DEIS of how extra wages might be spent or what improvements to the lives of area residents might result.

An attempt should be made to analyze the impact of the project on the State of Wyoming as a whole. The current unemployment rate of 11 percent statewide provides opportunity for the companies to hire Wyoming workers. The hiring of Wyoming workers would be a significant impact and should be addressed.

It would be valuable to have information on the makeup of the unemployed labor force in the project area. A study done by the Job Service Center in Rock Springs for the Sweetwater County Association of Governments may indicate that many of the unemployed have skills which would be needed on the Riley Ridge Project.

The EIS should address the tax impact the project would have on state finances. Mr. Edgerly questioned how much money the state would receive in federal royalties, in state severance taxes and ad valorem taxes, and in sales and use taxes. This impact should be addressed in the EIS.

Reponse to Comment 36.1:

Please refer to Section 1 of the FEIS, Summary, and to the Response to Comment 4.1.

It would be inappropriate to perform a state-wide labor analysis as part of the EIS process. A two-hour worker commute time was determined to be appropriate for use in the impact analysis. Please refer to the Response to Comment 17.1 in regard to potential employment impacts.

Regarding the Job Service Center data, for the most part Sweetwater County is outside the two-hour commute distance. Since the EIS was based on a worst-case analysis and a greater available work force in Sweetwater County would lessen the potential impacts by increasing the number of weekly commuters and decreasing the number of workers relocating to the area, the analyses would not be changed.

Revenues directly related to resource extraction associated with the Riley Ridge Project are the state levied ad valorem and severance taxes and a federally collected royalty. Important differences in these taxes are the time at which they are collected, the extent to which they are earmarked for special purposes, the extent to which they filter down to local governments rather than accrue only to the state government, and the basis for calculation.

The ad valorem tax accrues only to the state but is earmarked for the school foundation fund. None of the monies from this tax, which is at a rate of 12 mills against total value, goes to the general funds of the state or counties for discretionary use. The tax is applied to physical facilities, such as plants, pipelines, and wells, as well as to the resource extracted. On physical facilities the tax base is 25 percent of installed cost deflated to 1967 dollars and is payable whether or not the facility is operational. There is an approximate two year lag between the time the physical improvement is completed and the tax is first paid. The basis for valuation of the natural resource is the full value of the marketed product.

The severance tax in Wyoming on natural gas is 6 percent of the value of the gross product extracted as computed for ad valorem taxes. Distribution of the amount collected is as follows:

2.1666 percent	Permanent Wyoming Mineral Trust Fund
2.0000	General Fund
0.7500	Agency & Trust, Cities & Towns
0.2500	Agency & Trust, Counties
0.6666	State Highway Fund
0.1668	Wyoming Water Development Account

The tax is paid quarterly based on actual production during the quarter.

Where mineral extraction occurs on federal lands a tax cannot be levied by the state. The federal goverment, therefore, makes payments to the state that are in lieu of ad valorem taxes. This payment is 50 percent of the amount collected. A minimum royalty of $1/acre/year is charged on a lease capable of production in lieu of the rental fee. Once actual production commences, a royalty rate of 12.5 percent is collected on the market value on any resource extracted. Like the severance tax, some portion of the state funds are shared with the counties and communities where the resource extraction activities occur.

A precise estimate of the contribution of ad valorem, severance, and royalty payments to the state is not appropriate at this time, because the amount received would depend in large part on the quantity of gas actually produced and the market value at the time of extraction. In 1981, the revenue to Wyoming from the mineral severance tax alone was in excess of $138 million and had been increasing annually at about 30 percent over the preceding 5-year period. The effect has been to substantially increase the state's general fund and thereby benefit the entire state.

Comment 36.2:

Mr. Paul Henderson, Exxon Company, U.S.A., stated that the DEIS failed to place sufficient emphasis on the positive impacts of the project.

Reponse to Comment 36.2:

Please see Response to Comment 4.1.

Comment 36.3

Mr. Chuck Farmer, Wyoming Oil and Gas Commission, suggested that the oil companies use directional drilling to minimize the right-of-way widths necessary for access roads.

Wyoming Statutes specifically prohibit the venting and flaring of natural gas, unless authorized by the Oil and Gas Commission. This would be in direct conflict with the project's initial stages of plant operation.

Response to Comment 36.3:

The BLM and FS agree with this idea and encourage this concept of multiple wells on a single well pad and directional drilling. The agencies will encourage its use where practiceable and where necessary to minimize undue or unnecessary environmental degradation. This concept will be utilized on a case-by-case basis where it appears to be functional and appropriate.

Refer to Response to Comment 27.76 regarding the venting and flaring of natural gas.

Comment 36.4:

Ms. Carma Corra, Executive Secretary, Kemmerer Area Chamber of Commerce, expressed concern that the population figures in the DEIS were lower than those documented in the 1982 Kemmerer Community Profile. Given this fact, more emphasis should be placed on unemployment in Kemmerer and Lincoln County and how the Riley Ridge Project could improve Kemmerer's situation.

Response to Comment 36.4:

Please refer to the Response to Comment 23.12.

Anticipated socioeconomic impacts to Kemmerer which would result from the Shute Creek Alternative are discussed on pages 4-100 through 4-102 in the DEIS.

PUBLIC HEARING COMMENTS - BIG PINEY, JUNE 28, 1983

Comment 37.1:

The concerns of Ms. Cynthia Vickery, Kemmerer Area Chamber of Commerce, were covered in Comment 36.1.

Response to Comment 37.1:

See Response to Comment 23.12.

Comment 37.2:

The comment from Rick Robitaille, Executive Director, Petroleum Association of Wyoming, was covered in Comment 36.1.

Response to Comment 37.2:

Please see Response to Comment 4.1.

PUBLIC HEARING COMMENTS - KEMMERER, JUNE 29, 1982

Comment 38.1:

The comment from Ms. Carma Corra, Executive Secretary, Kemmerer Area Chamber of Commerce, was the same as her Comment 36.4.

Response to Comment 38.1:

See Response to Comment 23.12.

PUBLIC HEARINGS COMMENTS, ROCK SPRINGS, JUNE 30, 1093

Comment 39.1:

Mr. James Roth, Wyoming State Representative, had a question for the Forest Service regarding the assumption that new roads would be beneficial to harvesting of timber and that cutting timber is beneficial. It also means more EISs on timber cutting and more discussion on clear-cutting, slash disposal, replanting, etc.

Response to Comment 39.1:

The Forest Service recognizes that there are adverse impacts, as well as positive aspects of

timber harvest. If properly done, timber harvest and other timber management practices are invaluable tools that can be used to develop a forest condition that will accommodate meeting multiple management objectives.

The Forest Service also recognizes the value and adverse impacts of allowing natural processes to occur in areas such as wildernesses. In the Big Piney area, timber harvest is an important part of the overall management scheme.

The Forest Service applies resource management practices that are widely accepted in the resource management profession. For example, native tree species are regenerated in harvest areas from seed that is compatible with the site from an elevation and habitat type standpoint. Timber harvest and stand regeneration is done through application of sound biological principles accepted in the scientific community.

The purpose of the Environmental Analysis process is to systematically review and analyze public comments, management concerns, professional and technical input, and the best data available in order to make good resource management decisions. The goal is to be responsive to public need and to provide good stewardship through sound management of public lands. This is a process that results in better decisions.

If a timber harvest opportunity develops as a result of new road access associated with the Riley Ridge Project, an environmental analysis would be conducted. Before a harvest proposal would proceed, assurance would be made through this analysis and decision-making process that the multiple use management objectives for the area would be met. In the case of National Forest lands adjacent to the Riley Ridge area, both non-commodity and commodity uses are important. Wildlife habitat, recreation use, water, grazing and timber values are important in the general area.

Any timber harvest proposal would include management practices, mitigation measures, and application of ecologically sound silvicultural principles that would lead to accomplishment of multiresource objectives. Mr. Roth's comments suggest that a more indepth discussion of the silvicultural aspects are in order.

Silviculture is the theory and practice of controlling the establishment, composition, constitution, and growth of forests. Practices must conform to sound ecological principles to be successful. Through applied silviculture, the Forest Service objective is to maintain forests in a condition that will meet broad objectives. Over the long run, distribution of tree age classes, species composition, size of stands, and location of stands in relation to openings are planned to optimize wildlife habitat, visual resource, wood production, and other resource objectives.

On the Big Piney Ranger District, clearcutting and regeneration with lodgepole pine has been the principal harvest method. There is good reason for this. Most timber harvest proposals at this time are in stands of timber that are in a state of advanced deterioration with large amounts of downfall and high incidence of disease. Normally, the only option is to clearcut and start over with a new stand. In a clearcut situation, as is the case where wildfire has harvested a stand, the biologically suitable species of trees to start over with is lodgepole pine. This species is shade intolerant and functions as a nurse crop for spruce and fir. When we are working with stands of trees in the future that are thrifty and do not have disease problems or downfall to contend with, we will have the option to manage for ideal conditions. If part of the management objective is to maintain a healthy stand of trees, it would be best to have a variety of species since most insects and diseases are host specific. A monogamous lodgepole (or any other species) forest would invite epidemics.

It is the Forest Service's goal to exercise management options other than starting over, thereby creating a more diverse productive resource where timber production, wildlife habitat, and other values can and will be sustained at very high levels.

It is important to note that there are some limited opportunities to use partial cutting of timber on the Forest. The Big Piney District has a good example of a successful shelterwood harvest in Douglas-fir. In this case, stand conditions, fuel loading, and the biological characteristics of this species provided an opportunity for a partial cut harvest that was biologically sound and technically feasible.

Additional information regarding forest management practices in the Riley Ridge area is available at the Big Piney Ranger District Office in Big Piney and the Forest Supervisor's Office in Jackson, Wyoming.

COMMENT LETTERS REQUIRING NO RESPONSE

In addition to the letters that required specific comments, the BLM received nine letters which included information or opinions about the project. We thank the commenters for their time and effort in reviewing the DEIS, and their opinions will be considered in the final decision making process.

U.S. Department of Housing and Urban Development
Denver Regional/Area Office, Region VIII
Executive Tower
1405 Curtis Street
Denver, Colorado 80202

June 28, 1983

Mrs. Janis VanWyhe
Riley Ridge Project Leader
Bureau of Land Management
555 Zang Street, First Floor, East
Denver, Colorado 80228

Dear Mrs. VanWyhe:

Thank you for the opportunity to review and comment on the Riley Ridge Natural Gas Project Draft Environmental Impact Statement, Sublette, Lincoln, and Sweetwater Counties, Wyoming.

Your Draft has been reviewed with specific consideration for the areas of responsibility assigned to the Department of Housing and Urban Development. This review considered the proposal's compatibility with local and regional comprehensive planning and impacts on urbanized areas. Within these parameters, we find this document adequate for our purposes.

If you have any questions regarding these comments, please contact Mr. Carroll F. Goodwin, Area Environmental Officer at (303) 837-3102.

Sincerely,

Robert J. Matuschek
Director
Office of Regional Community Planning
and Development, 8C

STATE BANK OF BIG PINEY

BIG PINEY, WYO.

June 30, 1983

Ms. Janis VanWyhe, Project Leader
Riley Ridge Natural Gas Project
Bureau of Land Management
555 Zang St., First Floor East
Denver, Colorado 80228

Dear Ms. VanWyhe:

As Chief Executive Officer of this institution, I would like to enter the following testimony in your draft environmental impact study. I have lived in this country all of my life, and President of this institution more than twenty five years, and as such, I am familiar with the area, its people and the capabilities of both. It is my opinion that the majority of the people are interested in and are capable of handling the impact of having the plants constructed at either the Mesa or Buckhorn site. We are very aware of the economic value of having the construction done within our county, and I heartily encourage the construction of these plants in Sublette County.

Yours very truly,

Donald R Wassenberg

Donald R. Wassenberg
President

DRW:bjh

TOWN OF BIG PINEY
WYOMING
83113

July 7, 1983

Ms. Janis VanWyhe
Bureau of Land Management
Division of EIS Management
555 Zang Street, First Floor East
Denver, Colorado 80228

Dear Ms. VanWyhe:

The Town Council of Big Piney recognizes the benefits which the petroleum industry has brought to the Town and the surrounding areas over the past thirty years. It further recognizes the deep recession which has occurred in the past year as a result of the slow-down in the industry. Many businesses have closed, while others report large drops in revenues.

Not only has the industry improved the economy of our community through the increased tax base, thereby improving the community in general, but it has also created support services which have now all but come to a complete halt.

In light of these circumstances, the Council over-whelmingly supports and endorses the construction of the Riley Ridge sweetener plants in Sublette County. We believe that the proximity of the plants to the well field should be an overriding factor in determining their locations.

The representatives of the oil companies involved in the project, particularly Steve Kettelkamp of Exxon, have been most cooperative in apprising the Town and County agencies of their plans, and the Council believes that they will continue to offer their assistance and cooperation. The Town of Big Piney is now better prepared to deal with any related impact than it was in 1956-59 when drilling was at a peak and the Northwest Pipeline plant was built. We urge you to select the Proposed Action described in the DEIS as opposed to the Shute Creek Alternative.

The Town of Big Piney

Richard E. Holgate

Richard E. Holgate, Mayor

Attest:

Shirley Tanner, Clerk

cc: American Quasar
Northwest Pipeline
Exxon
Mobil
U.S. Forest Service
Bureau of Land Management
Senator Malcolm Wallop
Senator Al Simpson
Representative Dick Cheney

104 BUDD AVENUE POST OFFICE BOX 70 (307) 276-3554

SCHOOL DISTRICT NO. 9
SUBLETTE COUNTY
BIG PINEY, WYOMING 83113

DWIGHT PARRISH
SUPERINTENDENT
SHARRON PEARSON
BUSINESS MANAGER
RICK COSTELLO
HIGH SCHOOL PRINCIPAL

JOHN GALLEMORE
DIRECTOR OF ELEMENTARY EDUCATION, SPECIAL SERVICES AND CURRICULUM
MIKE BROMLEY
MIDDLE SCHOOL PRINCIPAL
DAVE GRIFFITH
LA BARGE PRINCIPAL

July 12, 1983

Ms. Janis Van Wyhe
Bureau of Land Management
Division of EIS Services
555 Zang Street, First Floor East
Denver, Colorado 80228

Dear Ms. Van Wyhe,

I have visited with you several times and have visited with representatives of the companies proposing development of the natural gas resources of the Riley Ridge area in relation to specific questions I had about the project and its potential impact. However, it may be appropriate something of a written response be prepared in the name of the school for inclusion into the documentation of the impact study.

This school district is perhaps somewhat different in the sense it is a school district that has made the transition from a primarily agricultural tax base district to one that derives in excess of eighty percent of its revenues from the oil and gas industry. As a result, much of the philosophical restructuring has already taken place so some of the trauma of industrialization is behind us. I am convinced the greatest advantage taken place is not the wealth originating from this development, and the wealth is significant, but instead is the richness originating from having these people associated with the oil and gas living in the community and contributing to our life style. A school district desperately needs skilled and educated individuals making their home in the district and insisting the program of instruction offered by the school system is sound and current instead of being dictated too by custom or tradition. One of the reasons this school district is an above average district is because that family moving here from Texas wanted to know why eighth graders could not take algebra since the school in Texas offered algebra or the family from Ohio wanted their child to have a physics program equal to the physics program in Cleveland. It is my sincere belief we can never document in an objective sense the value of these technically trained individuals to the school district.

I have no doubt the development of the Riley Ridge area resources will cause temporary strains to the school district and to the community.

Most surely any significant infusion of numbers to a small community will cause a degree of stress, however, I think this school district will be able to deal with the strain as well as any because of the historical background of the district in dealing with developments in a cooperative and effective way. If the involved companies cooperate with the school as they have pledged to do, I am confident the end result will be a stronger community and an even better school system.

I am not in a position to comment upon the need of the plant in terms of the local economy, however, I do feel comfortable in expressing the desire of the school system to have the resource developed from the perspective of the long term advantages we perceive coming to the school system from such development. In a sense, a school system must always advance and must always be seeking ways to become better because once stagnation sets in, the school system begins to collapse internally. I believe the challenge is to the advantage of this school district and have an idea this district can deal with the stress in an effective way and in a manner to ensure ten years from now this district will be recognized as truly an outstanding school system.

I would ask you to place this letter into the Riley Ridge file as an endorsement for the development of the Riley Ridge area with the processing plant built in the Big Piney area.

Sincerely yours,

Dwight Parrish

DP/lg

Dwight Parrish
Superintendent of Schools

Wyoming Telephone Company, Inc.

PHONE (307) 367-4321

BOX 160

PINEDALE, WYOMING 82941

July 14, 1983

Ms. Janis VanWyhe
Bureau of Land Management
Division of EIS Management
555 Zang Street, First Floor East
Denver, CO 80228

Dear Ms. VanWyhe:

The Wyoming Telephone Company provides service to the majority of Sublette County, Wyoming. We have installation and maintenance personnel located in Big Piney and Pinedale, Wyoming who provide service seven (7) days a week to the area we serve.

The petroleum industry has been a great asset to our County and communities. We sincerely approve of having the Riley Ridge sweetener plants located in Sublette County.

From the time the possibility of having these plants in our certificated area we have anticipated serving the communication needs of these projects.

We encourage you to select the Proposed Action as described in the Draft E.I.S., Riley Ridge Project.

Sincerely,

Earle F. Crandall

Earle F. Crandall
President

cc: American Quasar
Northwest Pipeline
Exxon
Mobil
U. S. Forest Service
Bureau of Land Management
Senator Malcolm Wallop
Senator Al Simpson
Representative Dick Cheney

P.O. Box 545
Big Piney, Wyoming
12 July 1983

Ms. Janis VanWyhe
Bureau of Land Management
Division of E I S Management
555 Zang Street, First Floor East
Denver, Colorado 80228

RE: Riley Ridge Gas Sweetener Plants

Dear Ms. Janis VanWyhe:

I am strictly against running a poison gas pipeline to Opal. In the event of a rupture, perhaps due to the extra corrosive element in the poison gas, more time would be involved in locating the problem, thus exposing a greater hazard than necessary. I feel the sweetener plants should be located as close to the field as possible.

Aside from the element of safety, our small community has attracted several businesses to the area to serve the petroleum industry. I feel by locating the sweetener plants in this area our community would be aided economically. We need that.

Since the poison gas exists in this area and we are already exposed to any existing danger, I feel we should also be entitled to any benefits to be derived therefrom.

My family and I live in Sublette County. We own our home and a business in Marbleton and also have livestock in the area. This is why I protest the poison gas pipeline being any longer than absolutely necessary.

Sincerely yours,

William Richard Evans

William Richard Evans

WRE:rhe

TOWN OF MARBLETON

MARBLETON, WYOMING

July 18, 1983

Ms. Janis VanWyhe
Bureau of Land Management
Division of EIS Management
555 Zang Street, First Floor East
Denver, Colorado 80228

Dear Ms. VanWyhe:

The Marbleton Town Council readily supports the construction of the Riley Ridge gas sweetener plants in Sublette County. The Council feels that the plants will benefit Sublette County not only in tax revenues but also in stimulating the local economy and therefore benefit the Town of Marbleton.

In recent years, Marbleton has been readying itself for an influx of people. The Town has a request in for expansion of the sewer system.

Our water system does have some problems, but we are working on them, and with the help of the oil industry, should the plants be built in Sublette County, we would be able to take care of our water problems in a short period of time.

The Town of Marbleton also has land surrounding the town available for annexation. And, as mentioned above, the utilities will be equipped to handle the annexation of land to the town.

For these reasons, not only would the Town of Marbleton benefit from the construction of the Riley Ridge gas sweetener plants, but we feel the town is ready for the influx of people that such a construction would cause.

The Town of Marbleton

Garry Eiden

Garry Eiden, Sr., Mayor

Attest

Alice Griggs

Alice Griggs, Clerk

cc: American Quasar
Northwest Pipeline
Exxon
Mobil
U.S. Forest Service
Bureau of Land Management
Senator Malcolm Wallop
Senator Al Simpson
Representative Dick Cheney
Department of Environmental Quality

JOHN R. SWANSON
P. O. Box 922
Berkeley, Calif. 94701

43

August 16, 1983.

Rock Springs District Office
Bureau of Land Management
P.O. Box 1869
Rock Springs, Wyoming 82901

Dear Sirs;

Please accept my comments, as follows, concerning:
- Proposed Riley Ridge Gas Field Development Statement -

I wish to inform that I form by oppose such Riley Ridge Gas Project!
As such program will substantially destroy air, surface and sub-surface lands, and Wilderness in Sub little County, as well as most of the western portions of the state of Wyoming.
With the air being, alone, to create Environmental havoc in Sub little, Fremont, Sweetwater, Lincoln, Hot Springs, Natrona and Carbon counties
and much air pollution to decimate the flora and fauna in these counties, and to essentially destroy current and proposed - potential Wilderness areas in this western - half of Wyoming.
In short, a social and natural disaster now in the making if such Gas Project is even marginally approved.
The Wyoming Range, Hams River and Salt River Range with extensions are of certain National Monument potential. With the Wind River Range and extended Environs of definite National Park status. Plus, the Upper Green River area, also, of National Monument potential. A rich complex of natural features now very rare in North America
and to soon be destroyed by industrial ignition.
These are our Nation's natural heritage lands and waters. and as such, must be permanently preserved to benefit Man, and all life, on this endangered planet.
I first became acquainted with this area of Wyoming some fifty years ago, and was then informed by members of my family that Sub little County was much the same as it was prior to the turn of the century; an impressive natural area.
Let us retain as national citizens such impressive natural features rather than to alter or destroy such natural features, and to prevent Wyoming from becoming just another Ohio or New Jersey. In short a permanent waste land.
and to always accept that when we save our natural lands and waters; we save America!

Sincerely,

J. R. Swanson

7-27-83 RILEY RIDGE

Ronnie & Pat Mills
3802 Driftwood
San Angelo, Texas
76904

Dear Janis,

First I want to apologize for this late letter. I just found out, last night, where to mail comments on the Riley Ridge Project.

My wife and I spend two weeks in September every year in the Tetons. To us, it's the most beautiful place anywhere in the lower 48 states. (We've never been to Alaska.) We strongly oppose any sort of activity which would cause any degradation whatsoever of the air quality, water quality, or wilderness atmosphere in Bridger-Teton. We become quite concerned when the EIS itself states that long term effects of the Riley Ridge Project cannot be predicted with confidence. We become even more concerned when local Forest Service people are candidly skeptical of the EIS

findings. And we become downright worried when we read statements like: "If the project is approved and violations in air quality do happen, the courts would determine *if* damages did occur and the appropriate *fines*."

1. *If* damages occur? How long will it take the courts to decide *if* damages occur? Will the plant keep operating in the meantime?
2. Fines? Fines!! Will paying fines cleanse the air and water? Will fines form a protective dome over one of the few Class I wilderness areas in this nation and protect its pristine qualities? What if profit margins and return-on-investments figures indicate to Exxon and others that paying occasional fines and polluting the environment is more

economically desireable than reconfiguring invested established plant?

3. Will <u>anyone</u> have the power to shut the whole project down if it does pollute the Bridger-Teton? Not likely. Once something like this is in place and operating, there's almost no way to "undo" it no matter what kind of ~~[illegible]~~ assurances may be given now.

In short, we vote "NO!". This whole thing is too wishy-washy. We're gambling with something here which, if lost, can <u>never</u> be brought back. And not Exxon or anyone else has the right to gamble with so precious a thing as the Bridger-Teton. It belongs to <u>all</u> Americans.

Thank you very much for your time and consideration. Sincerely,

Bonnie Mills
Pat Mills

SECTION 5

APPENDICES

RECOMMENDATIONS FOR GROUNDWATER MONITORING

POTENTIAL IMPACTS

Groundwater resources in the Riley Ridge Project area could be adversely impacted by a number of sources:

1) Drilling muds and chemical additives used as aids in drilling gas wells and waste water injection wells could contaminate fresh water aquifers.

2) Gas wells and waste water injection wells could act as conduits which allow the intermixing of freshwater aquifers with saline or contaminated aquifers.

3) Leaking well casings could allow hydrogen sulfide or saline water to escape from gas wells and waste water injection wells and contaminate fresh water aquifers.

4) Contents of leaky reserve pits and waste water ponds could migrate to shallow water table aquifers.

5) Drawdown in wells for the various sites could interfere with nearby wells and springs, reducing spring flows and necessitating lowering of pumps or deepening wells.

6) Pressure buildups in waste injection wells could cause rupture of casing or of confining formations permitting the wastes to migrate to unintended aquifers.

7) The wastes could be incompatible with the rocks or the water in the injection zones, permitting clogging the zones and excessive pressure buildups.

8) Clogging or pressure buildup could alter the flow pattern of water in the formations receiving wastes and thereby force inferior water to the surface or into other aquifers.

In order to detect adverse groundwater impacts it will be necessary to implement a groundwater monitoring program.

MONITORING PROGRAM CONSIDERATIONS

A comprehensive groundwater monitoring program should take into consideration:

1) The site-specific identification of all water-bearing formations;

2) The type of activity present at the site, (gas well, waste water injection well, water supply well, waste water treatment);

3) The local aquifer continuity, direction of flow, and hydraulic interconnections;

4) The local aquifer water users, including water wells and spring discharges;

5) The regional geology and groundwater movement; and

6) The regional locations of activities which could potentially impact the groundwater system.

7) The quality of the water in the various formations for possible use as potable water or for compatibility with waste water.

8) Periodic measurement of heads of nearby wells or discharges of springs.

9) The static water levels and production levels of water wells especially in relation to nearby wells or springs.

10) The relative heads of the water in the formations penetrated by water wells or injection wells.

11) Continuous measurement of the pressure under which injection is done. Abrupt changes may signal clogging or ruptures.

The collection of hydrogeologic information and the design and implementation of a groundwater monitoring program should be conducted in conjunction with interested state and federal agencies including the U.S. Geological Survey, the Bureau of Land Management, the Wyoming State Engineer, the Wyoming Oil and Gas Conservation Commission, and the Wyoming Department of Environmental Quality. Various regulations, including those administered by the Wyoming Department of Environmental Quality and the Wyoming Oil and Gas Conservation Commission, are designed to prevent or mitigate potential adverse impacts. These regulations require:

1) Permits be obtained for the drilling of gas wells and waste water injection wells.

2) Gas wells and waste water injection wells be cased and the annular space cemented from the surface to a depth below all utilizable fresh water levels.

3) Casing in waste water injection wells be pressure tested prior to beginning operation and at least once very five years during operation.

4) The inside casing diameter of gas wells and waste water injection wells be plugged with cement over designated intervals prior to abandonment.

5) A monitoring program be conducted whenever wastes are discharged to groundwaters.

Other than general regulations protecting groundwaters from contamination, no specific regulations have been promulgated on the control of drilling muds and chemical additives used in drilling wells, or on the protection of groundwaters from seepage from reserve pits or production waste water holding and evaporation ponds. In applying these rules and regulations the regulatory authorities are given a good deal of discretionary power. The information required to be submitted in permit applications; the procedures and materials permitted to be used in construction, operation, and abandonment; and the type and amount of monitoring required are all determined by the regulatory authorities.

MONITORING PROGRAMS

Several alternative groundwater monitoring scenarios are described below which would require different levels of monitoring effort. Specific methods for groundwater monitoring will be determined when sampling objectives, locations, and parameters are finalized.

REGIONAL MONITORING ALTERNATIVE

A regional groundwater monitoring program which measures general changes in groundwater quality, static water levels, and water movement in all identified fresh water aquifers in the region would allow the detection of changes in the groundwater system but may not be able to detect problems in time to prevent significant impact, or be able to identify the source of the problem.

SITE-SPECIFIC MONITORING ALTERNATIVE

A site-specific monitoring program aimed at measuring any changes in groundwater quality, static water level, and groundwater movement in

freshwater aquifers identified at a particular site would have advantages in pinpointing problems quickly, but could require an extremely high level of effort if all potential sources of impact are monitored.

REGIONAL AND SITE-SPECIFIC MONITORING ALTERNATIVE

In this monitoring scenario, selected activities or selected locations which are considered to be of a higher risk could be monitored on a site-specific basis. A regional monitoring program would be used to measure changes in the groundwater system for the remaining areas.

EVALUATE EFFECTIVENESS OF EXISTING SAFEGUARDS ALTERNATIVE

In this scenario, no new groundwater monitoring network would be established. Existing safeguards of regulations and stipulations covering the design, construction, operation, and abandonment of the gas well field may be adequate to protect the groundwater resources in the area. A coordinated groundwater monitoring effort would take place in that data resulting from existing safeguards, such as injection well pressure logs, casing logs taken during construction and maintenance (workover) periods, etc., would be evaluated by a central agency or review committee to establish potential negative groundwater impacts. This agency or committee would also coordinate groundwater regulatory efforts and develop guidelines pertaining to groundwater for the design, construction, operation, and abandonment of well field facilities.

EXISTING HYDROGEOLOGIC INFORMATION

Information on regional geology and groundwater resources is available from a number of U.S. Geological Survey publications, (Lines and Glass 1975; Privasky 1963: Oriel 1969: Rubey, Oriel, and Tracy 1975; Welder 1968). These sources are valuable in gaining a general understanding of the stratigraphy of geologic formations in the region, the locations of major faults, and the quantities and quality of water expected in water-bearing formations. However, these sources do not give the detailed information on aquifer locations, aquifer characteristics, and directions of groundwater flow needed to design a groundwater monitoring program.

RECOMMENDED ADDITIONAL STUDY

It is recommended that a detailed geologic study be undertaken to define the area hydrogeologic system. The objectives of this study would be to:

- Gather sufficient information on the hydrogeology of the area to develop a hydrogeologic model. Information should be gathered from published geologic reports, discussions with well drillers and government personnel knowledgeable in this area, and the review of drilling log data.

- Formulate a general groundwater monitoring program, or alternatively, determine that additional aquifer testing is necessary before a detailed groundwater monitoring program can be formulated, or determine that a groundwater monitoring program is infeasible. Information on the location of proposed facilities may be necessary to develop a monitoring program.

REFERENCES

Lines, G. C. and W. R. Glass. 1975. Water resources of the Thrust Belt of western Wyoming. U.S.G.S. Hydrologic Investigations Atlas HA-539.

Oriel, S. S. 1969. Geology of the Fort Hill quadrangle. Lincoln County, Wyoming. U.S.G.S. Professional Paper 594-M.

Privrosky, N. C. 1963. Geology of the Big Piney area. Sublette County, Wyoming. U.S.G.S. Oil and Gas Investigations Map OM-205.

Rubey, W. W., S. S. Oriel, and J. I. Tracey Jr. 1975. Geology of the Sage and Kemmerer 15-minute quadrangles, Lincoln County, Wyoming. U.S.G.S. Professional Paper 855.

Welder, G. E. 1968. Ground-water reconnaissance of the Green River Basin southwestern Wyoming. U.S.G.S. Hydrologic Investigations Atlas HA-290.

USDA FOREST SERVICE

BRIDGER AND FITZPATRICK WILDERNESS

AIR QUALITY RELATED VALUES ACTION PLAN

1983

Recommended by: Neil Jackson 7-13-83
Forest Supervisor Date
Bridger-Teton National Forest

Recommended by: Kenneth H Wood 8/18/83
Acting Forest Supervisor Date
Shoshone National Forest

Approved by: Wm McCuna 8/31/83
for Regional Forester Date
Intermountain Region

Approved by: S H Hanks 8/22/83
for Regional Forester Date
Rocky Mountain Region

BACKGROUND

Drilling for oil and gas on the Bridger-Teton started in the 1920's, and to date approximately 125 wells have been drilled. It is estimated that at maximum development there will be 238 operating wells.

The early wells were shallow (±3,000 ft.) and little gas or oil was found. With improvement of geophysical exploration technology, deeper wells (± 17,000 ft.) have located some areas of sour gas on and adjacent to lands administered by the Forest Service.

On the Bridger-Teton, oil and gas exploration and development has been increasing rapidly the past few years. This is due to very recent oil and gas discoveries in the "Overthrust Belt," and increased emphasis for development of domestic oil and gas reserves in this country. The overthrust belt is a complex geologic feature of folded, cracked, and contorted sedimentary rocks that have been thrust over themselves, trapping pockets of oil and gas. The belt runs from Canada through western Montana, along the Idaho-Wyoming border, and south into Utah and on into Mexico in a 60-mile band. The Department of Interior estimates that the overthrust area may contain up to 15 billion barrels of oil and 65 trillion cubic feet of natural gas. Recent advances in seismic technology have made for better identification of the location of the "stratigraphic traps," which may contain oil or gas at great depth. Discoveries in the overthrust at Pineview, Ryckman, Horse Ridge, and the related Madison formations (Moxa Arch) in the Riley Ridge area have oil companies generally agreeing that this is the "...hottest new area for drilling in the United States, offshore or on."

Oil and gas activities on the Forest have been confined to preliminary investigations (geophysical surveys) and exploration (test wells). Some wells have found natural gas, but none of these have entered the development phase. Based on recent discoveries of major gas fields, the American Petroleum Institute commissioned studies in 1980 to determine the potential siting of sulfur removal facilities if additional discoveries of natural gas were found.

Such a find has been made in the Riley Ridge area of the Big Piney Ranger District and associated Pinedale resource area lands. As a result, four gas treatment plants have been proposed for construction as early as 1984. It is estimated that the Riley Ridge field contains 17.5 trillion cubic feet of recoverable natural gas.

The Riley Ridge Project components consist of the following: (1) exploration, development, production and abandonment of a 163,200-acre, low-BTU gas field; (2) construction, operation, maintenance, and abandonment of four sour gas processing plants, with a total capacity of 2.8 billion cubic feet per day (CFD); (3) venting of various gases resulting from sweetening process; (4) construction, operation, maintenance, and abandonment of associated rights-of-way for gathering lines, trunk lines, railroads, access roads, transmission lines, and other ancillary facilities; and (5) processing and transportation of primary products and by-products.

The final phase of abandonment is programmed to begin at the end of a 30-50 year production phase and involves equipment, building and facility removal, field cleanup, well plugging, hazard elimination and surface reclamation.

Some portions of the abandonment phase will be ongoing or concurrent with development as dry holes occur or as wells become nonproducers and restoration is undertaken.

Within the Green River Basin, geophysical surveys are still in progress and it is anticipated that there will be additional producing wells located at the northern end of the Basin. This could result in additional sweetening plant sites being developed by 1994.

TABLE 1

EMISSIONS SUMMARY FOR RILEY RIDGE PROJECT[1/]

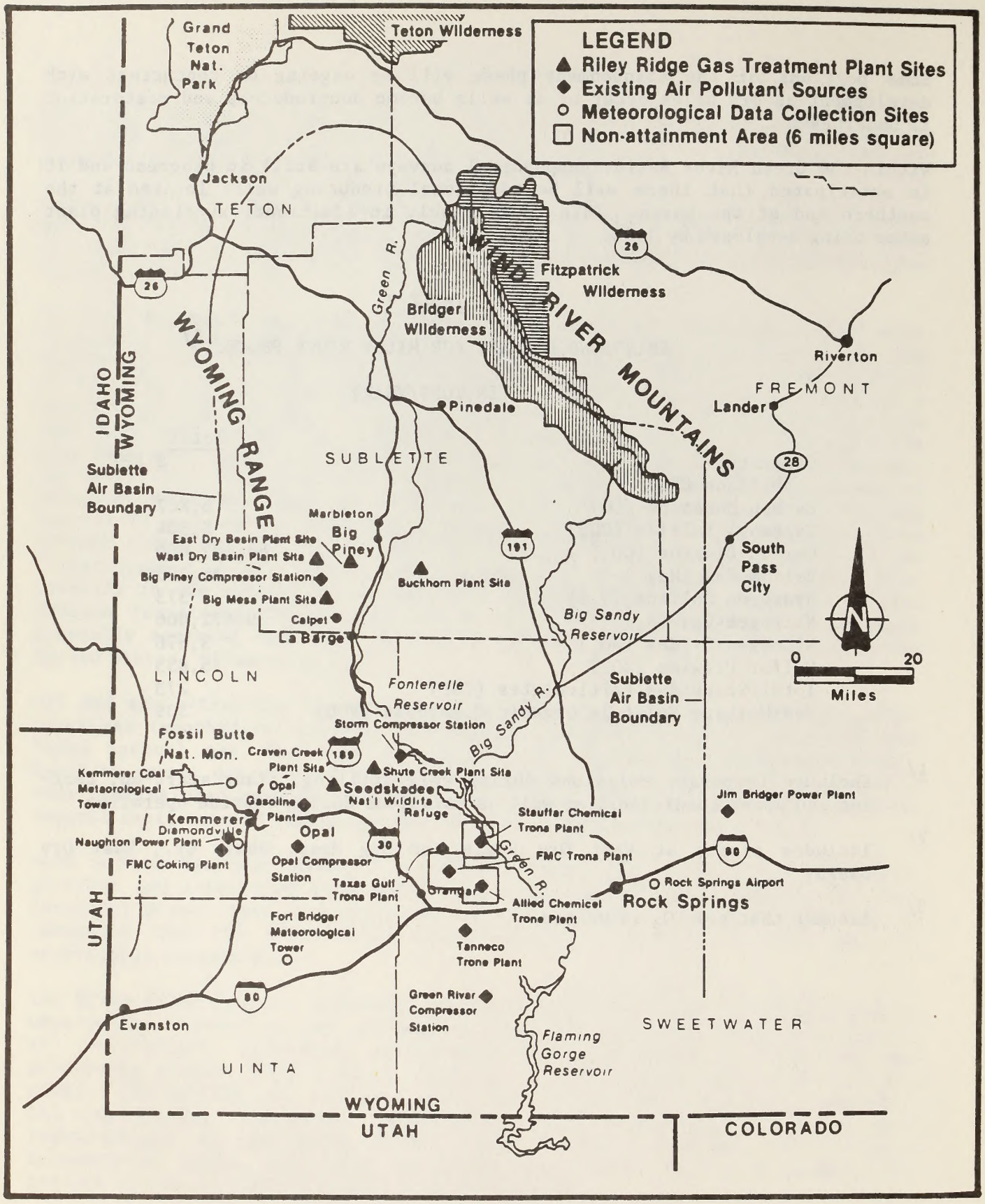
(IN TONS/YEAR)

	Total
Capacity (billion CFD)	2.8[2/]
Carbon Monoxide (CO)	6,867
Carbonyl Sulfide (COS)	8,304
Carbon Dioxide (CO_2[3/])	40,207,000
Helium Gas (He)	25,298
Hydrogen Sulfide (H_2S)	373
Nitrogen Gas (N_2)	9,672,000
Nitrogen Oxides (NO_x)	3,676
Sulfur Dioxide (SO_2)	15,833
Total Suspended Particulates (TSP)	273
Non-Methane Volatile Organic Compounds (VOC)	339

1/ Includes temporary emissions during well drilling, plant start-up, testing and upset conditions, as well as emissions during routine operation.

2/ Includes plants at West Dry Basin and Big Mesa, Shute Cr., East Dry Basin.

3/ Assumes that all CO_2 is vented.



EXISTING EMISSIONS SOURCES AND PROPOSED PLANT SITES IN THE RILEY RIDGE AREA

The Bridger and Fitzpatrick Wildernesses are both located downwind from the proposed gas processing plants near Big Piney in southwestern Wyoming. These Wildernesses are in the Wind River Mountain range, which is part of the Continental Divide.

The Bridger Wilderness, approximately 80 miles long, is located on the west side of the Continental Divide and encompasses 392,169 acres situated between 42° 37' N to 43° 23' N latitude and between 109° W to 109° 53' W longitude in Sublette and Fremont Counties, Wyoming.

The Bridger Wilderness provides outstanding opportunities for a primitive recreational experience. In 1982, this Wilderness experienced 242,000 visitor days primarily during a 4-month period, July to October. The extensive evidence of past glaciation, exposed geology, variety of vegetative zones, and active glaciers provide excellent opportunities for viewing or experiencing rugged terrain and superb scenery. Elevations range from 7,500 feet at Fremont Lake to 13,804 feet at the summit of Gannett Peak, the highest point in Wyoming. Approximately 130 miles of the designated route for the Continental Divide National Scenic Trail are located within the Bridger Wilderness.

The Fitzpatrick Wilderness is located east of the Continental Divide in the Shoshone National Forest and encompasses 191,103 acres between 42° 59' N and 43° 30' N latitude, 109° 28' W and 109° 45' W longitude in Fremont County, western Wyoming.

The Fitzpatrick Wilderness provides spectacular views of the eastern peaks and slopes of the Wind River Mountains and Continental Divide with some outstanding primitive recreational opportunities. Trail access in this Wilderness is limited and there is much that can be seen only if the hikers are willing to leave the few established trails and bushwack across country.

In 1982, this Wilderness experienced 39,200 visitor days during its normal 4-month use period. This side of the Wind River Mountains has a range in elevation from 13,804 feet at Gannett Peak to 6,000 feet at Bull Lake. There is extensive evidence of past glaciation, present glaciation, exposed geology, and a variety of vegetative zones. The presence of large glaciers along the Divide limits crossing opportunities between the Fitzpatrick Wilderness and the Bridger Wilderness, as does the extremely steep and broken terrain that is visited primarily by mountain climbers.

For the next 13 miles south of the Fitzpatrick Wilderness and east of the Continental Divide lies the Wind River Indian Reservation, which could be reclassified as a Class I area if the Shoshone and Arapahoe Tribal Councils so choose. South from Mount Bonneville to West Atlantic Peak, the Popo Agie Primitive Area is east of the Continental Divide and the Bridger Wilderness.

For those who climb to the top of the range, this entire 80 miles of Continental Divide (Wind River Mountain Range) provides exceptional recreational opportunities and visual experiences that are almost unequaled any other place along the Rocky Mountain range.

In locating any air pollution effects monitoring site, access will be a primary consideration.

The Wilderness Act (1964) gives the Forest Service responsibility to protect the wilderness resource on National Forest System lands from man-caused degradation. However, in response to air pollution, action under the Wilderness Act could probably be taken only after an impact on the Wilderness has occurred and consequences may be difficult to reverse once detected.

The 1977 Amendment to the Clean Air Act established an air quality program, Prevention of Significant Deterioration, which is designed to maintain air quality in those portions of the country where the air is cleaner than that which is required to protect public health.

Included in the Prevention of Significant Deterioration (PSD) program are the following:

1. The establishment of certain National Parks and Wilderness Areas as Class I areas.

2. The establishment of a permitting process that requires certain new sources of air pollution to obtain a PSD permit before construction and operation.

3. The establishment of small incremental limits on the amount of sulfur dioxide (SO_2) and total suspended particulates (TSP) that, except under certain circumstances, permitted new sources can add to Class I areas.

4. The requirement that the federal land manager take an affirmative responsibility to protect air quality related values (AQRVs) in Class I areas from adverse impacts caused by air pollution. Such action may result in denial of a PSD permit.

5. The establishment of a system which may allow the exceedance of Class I increments if a new air pollution source can demonstrate to the satisfaction of the federal land manager that there will be no adverse impact on air quality related values.

The only air quality related value identified in the Clean Air Act is visibility. However, other air quality related values identified by the Forest Service are flora, fauna, soil, water, odor, cultural--archeological and geologic features.

Development of natural gas resources will alter the character of the National Forests and associated public and private lands. One of the major impacts may result from air pollution produced during processing of sour gas. However, the degree of such impact is unknown at this time.

It is difficult to predict air pollution concentrations in mountainous areas. The problem is increased in the Wind River Mountains because of a lack of on-site meteorological data. In such cases, current modeling techniques may greatly over- or under-predict pollutant concentrations (possibly ± 100%).

Even if pollution concentrations do not exceed Class I increments in the Wind River Mountains, it is possible that some wilderness values may be impacted. However, it is also possible that the Class I increments may be exceeded without degradation to wilderness resources or values.

Recognizing the stated uncertainties, the attached action plan has been developed to: (1) identify sensitive receptors, if any, for each air quality related value; (2) determine baseline physical, chemical and/or biological conditions of each identified sensitive receptor; and (3) establish a program to monitor any impact on sensitive receptors caused by changes in air quality.

The action plan has been designed to look at not only those impacts from the Riley Ridge projects but at those impacts resulting from future oil and gas developments.

The information collected through initiation of this action plan should allow the Forest Service to meet its responsibilities under both the Wilderness Act and Clean Air Act.

ACTION PLAN

The objectives of the Action Plan are as follows:

1. Identify sensitive receptors, if any, for each air quality related value.

2. Determine baseline physical, chemical, and/or biological conditions of each identified sensitive receptor.

3. Establish a program to monitor any impact on identified sensitive receptors caused by changes in air quality.

To the degree possible, the list of sensitive receptors will be kept to a minimum.

Air quality related values and possible air pollution caused impact are shown in Table 2.

The Action Plan has been designed to investigate air pollution effects using study methods already developed and proven. None of the projects in the Action Plan are designed to develop or research study methods. All study methods used will have been previously published and had opportunity for review by the scientific community. The area where there is probably the least availability of approved study methods is visibility.

In locating any air pollution effects monitoring site, access will be a primary consideration.

Monitoring air pollution or air pollution effects in the Wind River Mountains will be extremely difficult for the following reasons:

1. Travel in the Wilderness is limited to foot or horse. Helicopter use may by approved if there is no other feasible method available for collecting data or where it is clear that such use provides the least degradation of the Wilderness resources (including social impacts). (Economics is not a consideration in this decision.)

2. Wilderness access and travel is difficult. The Fitzpatrick Wilderness is possibly the most rugged, remote Wilderness in the continental United States. Some potential sample sites are 2-4 days round trip by horse.

3. Snow conditions limit conventional travel in major portions of the Wind River Range from the end of November through the first of July. Some years the snow-free period is even shorter. Also, the area contains seven of the ten largest glaciers in the continental United States.

4. There are no structures having electrical power within the Wilderness. Locating and operating mechanical monitoring equipment is extremely difficult in such areas.

It is probably not possible to monitor any air pollutant within the Wilderness areas using reference methods established by the Environmental Protection Agency. Therefore, air pollutant concentrations will be determined through the application of dispersion models.

TABLE 2

AIR QUALITY RELATED VALUES

1. Flora (plants)
2. Fauna (animals)
3. Soil
4. Water
5. Visibility
6. Cultural-Archeological (i.e., structures, petroglyphs)
7. Geologic (i.e., fossils)
8. Odor

EFFECTS - Flora and Fauna

Changes in the Parameter

1. Growth
2. Mortality
3. Reproduction
4. Diversity
5. Visible injury
6. Succession
7. Productivity

EFFECTS - Soil

Changes in the Parameter

1. Cation Exchange capacity
2. Base saturation
3. pH
4. Structure
5. Metals concentration

EFFECTS - Water

Changes in the Parameter

1. pH
2. Total alkalinity
3. Metal concentrations
4. Anion and cation concentrations

EFFECTS - Visibility

Changes in the Parameter

1. Contrast
2. Visual range
3. Coloration

EFFECTS - Odor

Changes in the Parameter

1. Odor

EFFECTS - Cultural, Archeological, Geologic

Changes in the Parameter

1. Decomposition rate
2. Deposition rate

FAUNA

A composite presence list of terrestrial faunal species has been developed from existing forest lists for the Wind River Mountain range. As most of the terrestrial species present are relatively insensitive to the potential air pollutants, no monitoring is planned for this AQRV.

FLORA

For the terrestrial systems, it is probable that the flora will be more sensitive to changes in air quality than the fauna. Of the flora present, the lichens appear to be the most sensitive. Therefore, lichens will be used as the primary floral receptor with a select group of sensitive plants to be used as secondary receptors.

1. A list of flora will be developed for the Wind River Mountain Range from the previous vegetation studies completed within the range. The species on this list will then be ranked according to their sensitivity to emissions or the products that might result from chemical reactions in the plume or atmosphere. The most sensitive plant species will be used as secondary receptors. Tasks that will be accomplished include:

a. Collection and combining of flora lists.

b. Review and ranking of plant species for sensitivity.

c. Selection of plant species for use as secondary receptors.

2. A qualified botanist or ecologist will determine coverage of the selected secondary receptors within the Wind River Mountain Range and their presence within the habitat/community types known to exist. Representative habitat/community types will be selected throughout the mountain range and these sites will be visited to determine presence of sensitive plant species as well as to establish trend plots. Tasks that will be accomplished by this project include:

a. Compare receptor list to constancy, occurrence and presence lists for habitat/community types present within the Wind River Mountains.

b. Select representative types from existing habitat/community types and photo identify these sites.

c. Visit selected habitat/community types to check sites for presence of sensitive plants.

d. Establish vegetative trend plots within selected habitat/community types.

3. LICHENS SURVEY. Lichens, a symbiotic association between algae and fungi, are possibly the plant group most sensitive to air pollution. Lichens have no root systems and receive all their nutrients and moisture from the atmosphere. They have no excretion systems and as a result may concentrate both beneficial and phytotoxic materials. Gases such as sulfur dioxide, when dissolved in water, will attack the algal symbiont in the thallus resulting in chlorosis, phaeophtin formation or plasmolysis. Such injury can result in plant death.

Lichens have been used as bioindicators to determine severity and extent of air pollution around numerous pollution sources. The varying sensitivity of different lichen species to air pollution and their long life span (100+ years) make them an ideal bioindicator and sensitive receptor for this study.

Lichens are important components of pioneer habitats such as those found in much of the Wind River Range. They are initial rock and soil colonizers and may supply relatively large amounts of available nitrogen for higher forms of plant life.

A lichensurvey will be conducted to produce the following:

1. A floristic inventory of the lichen species.

2. Establishment of permanent lichen study plots.

3. Analysis of sensitive species for content of airborne elements.

FLORISTIC SURVEY

The purpose of an initial floristic study is to inventory the lichen flora as it now exists--hopefully, before pollution begins or is at very low levels. After future resurveys, the amount of damage to the lichens or loss of species, when compared with the initial survey, may be considered to be proportional to increases in air pollution. The data from the initial survey will be presented in three parts: (1) location of collecting sites; (2) an annotated list of the species; and (3) checklists of the species at each site. Resurveys will be done every 5-10 years.

PERMANENT LICHEN STUDY PLOTS

The purpose of establishing lichen study plots is to provide permanently marked reference sites that can be photographed and studied at intervals. They represent a sample of the lichen communities, obviously not a statistically significant sample but, nonetheless, one which can provide some quantification of the changes. By comparing later photographs with the originals, one can measure growth rates of the various lichen species and get a better idea of changes in species coverage and community composition which can be correlated with pollution stress.

Ten to twenty plots will be set up on rock surfaces throughout the length of the Wind River Range. Each quadrat will be demarcated by four drilled corner holes to form a 20 x 25 cm (8½ x 11") area on the rock. After taking color photographs, species in the quadrat will be tabulated and small samples collected adjacent to the quadrat for later identification of the species with sporing or chemical tests. The plots will be resurveyed every 3-5 years.

ELEMENTAL ANALYSIS

The purpose of elemental analysis is to determine baseline values that can be compared with future analysis. Samples of select species will be collected near each of the permanent study plots. Each sample (by species) will be analyzed for Al, B, Ca, Cu, Fe, K, Mg, Mn, Na, P, Pb and Zn.

Each plot will be resampled and analyzed every 3-5 years.

WATER

The Bridger and Fitzpatrick Wildernesses and Popo Agie Primitive Area contain over 2000 lakes, many of which support golden, rainbow, cutthroat and brook trout fisheries. In general, these lakes have a granitic bedrock geology and lie above 9,000 feet in elevation. A survey of lakes in the Bridger Wilderness conducted in the early 1970's found that 70% of the lakes had alkalinities less than 225 micro equivalents per liter. This low buffering capacity indicates that the aquatic ecosystems in the area have little, if any, protection from acidic deposition.

The upper elevations of the Wind River Mountains receive over 45" of precipitation per year, mostly in the form of snow.

A major concern for the lake ecosystems is possible "acid shock" during snowmelt. Acid material in the snow causes a freezing point depression which can result in the hydrogen ion concentration of the first melt water, being 5-10 times that of the bulk snowmelt.

It is possible that the first snowmelt would have little to no interaction with the frozen soils before it enters the lake systems. As a result, the lake chemistry may end up being the same as the initial snowmelt chemistry for a short time period.

Another concern is the long-term effect of acidic deposition upon the ability of a lake watershed to continue to generate buffering capacity.

Biotic impacts to lake ecosystems caused by pH change include changes in reproduction, growth, mortality, and species diversity of phytoplankton, zooplankton, macroinvertebrates and fish. Phytoplankton, zooplankton, and macroinvertebrates, major fish foods, are impacted at higher pH levels than fish and as such may be better sensitive receptors.

MONITORING - All sampling and laboratory analysis will be conducted using guidelines established by the Aquatic Effects Task Group of the Interagency Task Force on Acid Precipitation.

SNOW PACK - Snowfall will be sampled throughout the season and particularly just prior to snowmelt to determine what amount of over-winter atmospheric deposition has take place. The samples will be collected by the Snow Survey Division of the Soil Conservation Service at selected snow courses in the Upper Green River basin and Wind River drainage.

The snow samples will be analyzed for the following:

pH
titratable acidity
specific conductance
alkalinity
Calcium (Ca)
Magnesium (Mg)
Potassium (K)
Sodium (Na)
Aluminum (Al)

Iron (Fe)
Manganese (Mn)
Silicon dioxide (SiO_2)
Sulfate (SO_4)
Nitrate - Nitrogen (NO_3 - N)
Chlorine (Cl)
Total dissolved PO_4 - P
Dissolved ortho PO_4 - P
Dissolved organic carbon
Color
Flouride (Fl)
Ammonium (NH_4)

LAKES - Using alkalinity data from a Wyoming Game and Fish Department survey conducted in the early 1970's, at least 3 sensitive lakes will be identified in Bridger Wilderness. Factors other than alkalinity used to identify sensitive lakes include watershed-to-lake volume ratio, aspect, aquatic species diversity and access.

Water samples will be collected in the identified lakes and in their inlet and outlet streams every two weeks from ice-out through fall turnover. The same chemical analysis will be done on the lake samples as on the snow samples. Samples will be taken both above and below the thermocline for at least one location.

Zooplankton and macroinvertebrates will be sampled in the same lakes with the same sampling frequency.

In addition, a mid-season fish census will be conducted by the Wyoming Game and Fish Department.

Also, a surface and core sediment sample will be taken from each indicator lake for diatom analysis. On one of the indicator lakes, field measurements of pH will be made on a daily basis for approximately two weeks during the early period of snowmelt to help determine "acid shock" potential.

There is no alkalinity data available for lakes in the Fitzpatrick Wilderness and Popo Agie Primitive Area. While these lakes are probably as sensitive as those in the Bridger Wilderness, it is not possible at this time to identify those lakes which are most sensitive. Therefore, an initial survey of 30-50 of the lakes which are probably the most sensitive will begin as soon as the lakes are accessible (probably after July 15). After completion of the initial survey, 2-3 sensitive lakes will be identified for each area. Detailed sampling such as that proposed for the Bridger Wilderness will probably not be started in the Fitzpatric Wilderness and Popo Agie Primitive Area until 1984. However, this decision will depend on how quickly the initial survey can be completed and weather conditions.

The lake monitoring program for subsequent years will be refined based upon the first year's data.

ACIDIC DEPOSITION MONITORING - Two acid deposition monitors will be installed and operated as near as possible to the Wilderness boundary. Snow core samples will be taken at the sites during the snow cover months.

SOIL

The general phenomenon of atmospheric deposition includes three major mechanisms by which substances are transferred from the atmosphere into ecosystems:

1. Absorption and adsorption of gases.

2. Impaction and gravitational settling of fine aerosols and coarse particles, and

3. Precipitation, which includes both dissolved substances and particles that are removed from the atmosphere in rain, snow, hail, dew, fog, or frost.

The consequences of chemical inputs to soils vary greatly, depending upon the rates, the character of the vegetation, and the physical-chemical properties of the soil.

Both dry and wet deposition may affect the soils within the Bridger and Fitzpatrick Wildernesses by changing:

1. cation exchange capacity

2. leaching rates of plant nutrients

3. rates of microbial processes, e.g., nitrogen fixation

4. decay rates of forest floor materials

5. availability of phosphorus to plants

6. solubility of elements toxic to plants

7. quantity of hydrogen ions in the soil

8. sulfate adsorption capacity

In an effort to establish base line soil data and instigate a monitoring system in the potential impact areas, the following program is planned for the Bridger Wilderness. By the end of the year, the following will be completed:

1. An Order I soil inventory in selected watersheds. Profiles will be described for each soil series in accordance with Soil Survey Manual (Soil Staff, 1981), and classified in accordance with the Soil Taxonomy (Soil Survey Staff, 1975).

2. A laboratory analysis of the identified soil types.

3. An evaluation of the buffering capacity of the mapped and identified soils.

4. A reconnaissance evaluation of soils elsewhere in the Wilderness as related to the survey of the monitored lakes and their associated watersheds.

The sampling procedures will follow national accepted standards.

Profiles (Order I inventory)

Profiles will be described for each soil series in accordance with Soil Survey Manual guidelines (Soil Survey Staff, 1981) and classified in accordance with soil taxonomy (Soil Survey Staff, 1975).

2. Characterization samples to document each series mapped as a major component will be collected. Samples from each major horizon will be analyzed for:

pH (water) -
Cation Exchange Capacity
CEC - (Chapman, 1965)
Exchangeable bases - (Heald, 1965; Pratt, 1965a, 1965b)
Exchangeable acidity - (Peech, 1965)
Organic matter - (Sims & Huby, 1971)
Texture - (Day, 1965)
Sulfate adsorption capacity

Clay mineralogy of selected samples will be determined by X-Ray diffraction (Thiesen and Haward, 1962); Whittid, 1965).

Estimate of number of samples:

4 samples per pedon @ 10 series and
2 profiles per series (4x10x2) = 80 samples for characterization.

3. Monitoring Transects. At each lake a monitoring transect will be established to traverse the watershed. Samples will be collected at fixed intervals along transect by combining 5 cores (2.5 cm diameter x 25 cm depth). The cores will be split in 0-10 and 10-25 cm increments. The samples will be collected at 30 stations at each transect (3 transects [lakes] x 30 stations x 2 depth increments = 180 samplings). Transect ends will be permanently marked to allow continued monitoring. Transect sample will be analyzed for the sample properties as described for the characterization samples, with the exception of clay mineralogy.

At the end of the 1983 field season, the soils data for the Bridger Wilderness will be analyzed to determine if a similar survey should be initiated in the Fitzpatrick Wilderness.

VISIBILITY

The Forest Service needs information in the following areas to determine the impact on Wilderness users' visual experience caused by potential visibility degradation.

1. The importance of visibility to Wilderness users. This will be initiated by reviewing existing studies which have been done to look at importance of various Wilderness attitudes to user experience.

2. The identification of a number of point-to-point views within the Wildernesses which are representative of the area's visual attributes. This

identification will only consider views within the Wilderness Areas; no integral vistas (inside to outside views) will be identified. The time of year and time of day that each identified view is important will also be identified.

3. The importance of change in the various visibility parameters (contrast, coloration, visual range) to Wilderness users' visual experience. Study methods in this area have not been adequately defined. The Regions will write to the Chief of the Forest Service expressing this need as a high priority for research.

4. The determination of baseline visibility conditions (visual range and contrast) and causes of visibility impairment (fine particulates including sulfate). Such monitoring will be initiated when reference methods are established.

METEOROLOGY

Meteorological data are needed to:

1. Determine susceptibility of Wilderness ecosystems to air pollution impacts.

2. Provide valid information for air quality modeling to determine concentrations of impacting pollutants.

The Bridger National Forest will install a Remote Automated Weather Station (RAWS) near the head of Sweeney Cr. outside of the western boundary of the Bridger Wilderness in July. The RAWS will be instrumented with sensors for wind speed and direction, temperature, humidity, precipitation, and modified sigma theta. RAWS use satellite telemetry to transmit data and are solar powered. In addition, the Bureau of Reclamation will provide two additional RAWS. These two stations will probably be located within the Wilderness boundary. The Forest Service will be responsible for installation, maintenance, and arranging with Boise Interagency Fire Center (BIFC) for the use of their down link. The RAWS will be in operation for at least 2 years; however, 5 and 10 years are needed for an adequate data base.

In addition to RAWS data that will be available on an hourly basis, the Soil Conservation Service has indicated the availability of open channels at their Snotel sites which could be utilized.

The University of Wyoming is developing a "Met" net in western Wyoming that will provide hourly data for the summer months each year for the next 5 years. This information can be made available for the cost of transcribing from the tapes.

The following program will provide some of the needed meteorological data:

1. RAWS will be installed at sites which best represent the meteorology of the Wilderness Areas.

2. A limited amount of upper air data will be collected within the Wilderness Areas using radiosondes.

3. A determination will be made concerning the use of vacant channels at Snotel sites.

4. Meteorological data will be collected from other governmental agencies.

Environmental Assessment Needs

The Forests must prepare an Environmental Assessment to cover the following installations or actions within the Wildernesses:

1. RAWS sites.

2. Drilling rocks for designation of lichen study plots.

3. Digging soil survey pits.

4. Use of helicopter for various studies.

5. Removal of vegetation for study.

COORDINATION

The following organizations will be contacted to discuss the Action Plan and determine if there are areas of mutual concern:

Wyoming Governor's Office (Cheyenne, WY)

Wyoming Air Quality Bureau (Cheyenne and Lander, WY)

Environmental Protection Agency (EPA) (Region 8, Denver, CO)

EPA Environmental Research Laboratory (Corvallis, OR)

Wyoming Game & Fish Department (Cheyenne, WY)

University of Wyoming (Laramie, WY)

Western Wyoming College (Water Laboratory, Rock Springs, WY)

Grand Teton National Park (Moose, WY)

Yellowstone National Park (Mammoth, WY)

Rocky Mountain Oil and Gas Association (RMOGA) (Denver, CO)

Overthrust Industrial Association

Wind River Indian Reservation (Shoshone-Arapahoe) (Fort Washakie, WY)

Environmental Defense Fund

Wyoming Outfitters Association

The Wilderness Society

Sierra Club

Jackson Hole Outfitters and Guides Association

Sublette County Outfitters Association

Greater Yellowstone Outfitters (various communities)

Cattle and Sheep Users of the Bridger Wilderness

Chamber of Commerce (various communities)

Wyoming Game & Fish Department (local representatives)

Pinedale Conservation Groups

BRIDGER WILDERNESS
AIR QUALITY RELATED VALUES
ACTION PLAN
1983 COSTS

FLORA AND FAUNA NEEDS		DOLLARS	DAYS
1A.	Collection and mapping of vegetation lists Sheryl Goodrich Duane Atwood, Range Mgmt. 30-60 days per diem--GS-12 salary	$ 1,560	60
B.	Forest review of list		5
C.	Forest select sensitive receptors		2
2.	Lichen survey, per diem and travel	5,000	30
	Andy Youngblood per diem and travel	480	30
	Lester Fluckinger		
	Subtotal	$11,924	97
ACID DEPOSITION			
1.	Wyoming Game and Fish data analysis	2,000	30
2.	Train Wilderness Rangers, one person per diem	200	1
3.	Location and operation of two acid deposition monitors	10,000	
4.	Monitoring of lakes and streams	45,300	370
5.	Soil baseline monitoring	21,735	
	Subtotal	$79,235	401
METEOROLOGICAL NEEDS			
1.	Gather upper air data	$1,000	4
2.	Install and maintain two RAW stations	2,240	
3.	Model and map air pollution stagnation areas	3,000	
	Subtotal	$6,240	
ENVIRONMENTAL ASSESSMENT NEEDS			
Write needed EA's	Subtotal	$ 1,000	10
TOTAL COST OF TECHNICAL WORK		$98,399	512

COORDINATION OPPORTUNITIES AND NEEDS

Travel and Per diem (1 day @ $75)	Days	Cost	Total
Forest	22	$75	$1,650
Region 4	12	75	900
Region 2	*(13)	75	(975)
Subtotal	34		$2,550
SLIDE PRESENTATION PACKAGES			
1. Oriented to those organizations that can help technically Length 20 minutes			$500
2. Oriented to those groups we need their understanding and approval Length 15 minutes			500
Subtotal visual aids			$1,000
Total Coordination Needs-Costs	34		3,550
1983 GRAND TOTAL	546 days		$101,949

*R-2 Costs

BRIDGER WILDERNESS
AIR QUALITY RELATED VALUES
ACTION PLAN
1984 COSTS

ACID DEPOSITION NEEDS	DOLLARS	DAYS
1. Operation and maintenance of two acid deposition monitors	$10,000	
2. Monitoring of streams and lakes	16,000	20
3. Soil baseline monitoring	9,295	10
METEROLOGICAL NEEDS		
1. Install and maintain two RAWs stations	2,240	
	$37,535	30

ANNUAL MONITORING COSTS	$37,535	30

*Either in 1986 or 1988, we will probably have to acquire:

2 RAWS Stations	$22,000
2 Acid Deposition Monitors	10,000

The hardware loaned to FS by other agencies will probably have to be returned.

**Every third year, the lichen survey plots must be read at a cost of $3,000 and 5 work days.

LONG-TERM MONITORING COSTS	
30 Years	$1,216,050
50 Years	$2,026,750

FITZPATRICK WILDERNESS
POPO AGIE PRIMITIVE AREA
AIR QUALITY RELATED VALUES
ACTION PLAN
1983 COSTS

FLORA AND FAUNA NEEDS	
Lichen Survey	$ 5,000
ACID DEPOSITION NEEDS	
Sampling of lakes	$ 5,000
Location and operation of acid deposition monitor	$ 5,000
METEOROLOGICAL NEEDS	
Installation and maintenance of RAW stations	$ 1,000
	$16,000

Action plan for 1984 and future years will be dependent upon the results of lake samples taken this year.

FISHERIES AND SURFACE WATER QUALITY MONITORING PROGRAM

FISHERIES MONITORING PROGRAM

The monitoring program will be implemented to observe changes in fish habitat (including water quality) or fish populations that would be detrimental to the fishery. Should a change be observed that is linked to the applicant's development, the applicant will take corrective measures to eliminate the cause. The monitoring program will be set up in three major areas: 1) a site-specific monitoring station, 2) three or four long-term monitoring stations to observe cumulative well field development effects, and 3) annual reconnaissance of all applicant-constructed facilities to observe changes that could harm the fishery. The determination of the type of monitoring program will be made at the time a specific development site is located.

If the Wyoming Game and Fish Department (WGF), Forest Service (FS), and Bureau of Land Management (BLM) determine that the fishery resource may be affected as defined by the following significance criteria, a site-specific monitoring station(s) will be established downstream and upstream of the area of activity (i.e., well pads, pipeline crossing, access road, etc.). Sampling will be supervised by the WGF, FS, or BLM depending on the location of the site and the type of data to be collected.

FISHERIES SIGNIFICANCE CRITERIA

1. Impacts to fisheries resulting from accidental spills of chemicals are considered significant if changes in water quality exceed WDEQ water quality criteria or exceed toxic levels for aquatic life. These criteria were developed to protect aquatic life based on the Environmental Protection Agency (EPA) 1976 Quality Criteria for Water. For example, a sour gas pipeline break resulting in H_2S concentrations greater than 2 μg/liter in affected streams is considered significant.

2. Impacts to fisheries are considered significant if critical habitats (for example, spawning areas) are affected by increased sedimentation during critical months of fish use, April to June

for cutthroat trout and rainbow trout and September to November for brook trout and brown trout. Effects of sedimentation will be monitored at both site-specific and long-term monitoring stations. Effects will be determined by analyzing the results of water quality, benthic macroinvertebrate, trout habitat, and trout population studies as described in this monitoring plan.

3. Impacts to fisheries are considered significant if beaver ponds would be removed or lost; beaver ponds provide important habitat to fish during low flow periods and drought years. Impacts to beaver ponds will be evaluated during the annual reconnaissance of all applicant-constructed facilities as described in this monitoring plan.

4. Impacts to fisheries are considered significant if culverts at road crossings create barriers to fish movement; barriers can prevent normal movement of both adult and larval fish, increase predation, limit habitat availability and reproductive success, and ultimately decrease population numbers. Impacts due to culverts will be evaluated both after quarterly water quality/ benthic invertebrate sampling and during the annual reconnaissance of all applicant-constructed facilities.

5. Impacts to streams currently under special WGF and/or BLM management for Colorado cutthroat trout are considered significant. Disturbance to and near these streams could degrade existing habitat conditions, increase the risk of illegal fishing pressure, and threaten efforts to establish a naturally reproducing population of pure Colorado cutthroat.

6. Indirect impacts caused by human population increases are considered significant if the estimated increases in illegal fishing would be greater than or equal to 15 percent over expected baseline conditions. This significance criterion has been used in previous EISs (BLM 1983, Chevron Phosphate Project Draft EIS) and this increase is also considered significant by WGF biologists since any increase in fishing pressure both legal and illegal would tax the reproductive capabilities of the native and non-native trout population and also tax the existing enforcement and stocking capabilities of WGF.

MONITORING PARAMETERS

At both the site-specific monitoring stations and long-term monitoring stations the following parameters, as a minimum, will be measured and evaluated:

1. Sediment Loads. This can be measured for actual increases in sediment loads and/or changes in macroinvertebrate densities of sediment-intolerant species versus sediment-tolerant species.

2. Trout Habitat. Changes could be measured for a predetermined distance (perhaps 300 to 500 feet depending on stream width and

sampling a representative reach). Parameters measured will be water width, water depth, channel width (measured as described by Dunham and Collotzi, USFS, in their Transect Methodology handbook cited later in this appendix), bank erosion, and trout cover (measured using Habitat Quality Index methods). These measurements will be critical below and above construction that could change channel morphology, e.g., culverts, bridges.

3. Trout Populations. Trout population densities and standing crops will be measured primarily using electrofishing equipment. Population estimates will generally be made using the DeLury method. This work will be done by the WGF.

Additional parameters, if any, and their methods of measurement will be determined at the time the station is actually located. When a station is picked, baseline information will be collected before any work takes place. After the work is initiated, sampling should occur immediately afterwards, quarterly for at least one year, and then as long as the significance criteria require.

If potential development problems appear to be minimal or the area of low fishery value, an interagency agreed upon annual reconnaissance will suffice. This type of reconnaissance, defined and agreed to by the WGF, BLM, and FS, will determine if any problems are occurring (e.g., increased sediment loads), the location of the cause (e.g., erosion from a road), and ways to eliminate the problem (e.g., improve drainage system).

If a significant impact occurs, the applicant(s) will be required to take corrective measures as recommended by the FS, BLM, or WGF. A significant impact will be determined as a statistically significant change from the baseline information resulting from the development activity. The change measured could occur in one of the three aforementioned areas (sediment loads, trout populations, or trout habitat) or a combination of all three. It is important that all measurements use established interagency-approved methods that can be statistically tested and reproduced by different personnel. It is also important that all methods used be at least compatible, if not identical, with the methods used by ERT to collect baseline data. These methods are described in the following methodology section.

MONITORING METHODOLOGIES

Sediment Loads

Baseline benthic macroinvertebrate samples were collected in mid-August 1982. Monitoring sampling should be done quarterly with one quarter's sampling being conducted in mid-August. Sampling stations should correspond to those selected for the water quality monitoring. These stations are F-1, B-1, PG-1, and BC-1 (see the Wildlife and Fisheries Technical Report). Sampling will be supervised by the BLM or FS.

At each station three replicate samples will be collected from a riffle area, using a Surber square-foot bottom sampler with 240 μ/meter mesh netting. Bottom disturbance should be limited to no more than 60 seconds in order to correspond to the baseline method. The sampled contents will be placed into a wide-mouth polyethylene or polypropylene jar, preserve with 10 percent formalin and labelled. Samples will be shipped to a contracted laboratory for analyses.

Laboratory procedures should include rinsing the sample (to remove formalin) in a standard 30-mesh sieve and sorting and picking the organisms from the debris. Sorting is best accomplished using a white enameled pan. Sorted organisms are identified and enumerated using a 10 to 80X dissecting microscope. Chromonids and oligochaetes will be identified under a compound microscope. Identification should be to the lowest taxonomic level practical.

Data analysis should include mean density (numbers/square meter), species relative abundance (% RA), mean diversity ($\bar{d}$), and equitability (e). Mean diversity and equitability values should be calculated for each station using formulae and tables found in Weber (1973).

In addition to the above data analyses, an evaluation of the number of silt-tolerant species versus the silt-intolerant species should be made. This can be done by using the information found in Merritt and Cummins 1978.

References

Merritt, R. N. and K. W. Cummins (eds.). 1978. An introduction to the aquatic insects of North America. Kendall/Hunt Publishing Company, Dubuque, Iowa.

Weber, C. I. (ed.). 1973. Biological field and laboratory methods for measuring the quality of surface waters and effluents. U.S. Environmental Protection Agency, Cincinnati, Ohio.

Trout Habitat

No change in approach from the references below. Sampling will be supervised by the BLM or FS.

References:

Binns, N.A. Habitat quality index procedures manual. Wyoming Game and Fish Department, Cheyenne. 208 pp.

Dunham, D. and A. Collotzi. 1975. The transect method of stream habitat inventory. Guidelines and applications. U.S. Forest Service publication, Ogden, Utah.

Trout Populations

Trout population densities and standing crops will be measured primarily using electrofishing equipment. Population estimates should be made at least once per year both at established site-specific stations and at the long-term monitoring stations. The field effort should occur sometime in late summer or early fall when streamflows are down. Population estimates will generally be made according to DeLury 1947. This work will be performed by the WGF.

Reference:

DeLury, D. B. 1947. On the estimation of biological populations. Biometrics 3(4):145-167.

SURFACE WATER MONITORING PROGRAM

The surface water monitoring program is primarily intended to detect changes in water quality which may affect aquatic life. Additionally, the program will detect changes from baseline conditions which may indicate the need for more extensive monitoring. Sampling will be supervised by the BLM or FS.

Stream sampling locations will include the four established stations in the well field on Fish Creek, Beaver Creek, Pine Grove Creek, and Black Canyon Creek as well as others that may be specified by the Authorized Officer. These stations will coincide with locations for aquatic monitoring stations (Stations F-1, B-1, PG-1, BC-1, see Wildlife and Fisheries Technical Report).

The following parameters will be measured monthly:

- discharge
- temperature
- specific conductance
- dissolved oxygen
- pH
- turbidity
- alkalinity
- total suspended solids (TSS)

Discharge should be measured using a direct-reading Marsh-McBirney current meter according to USGS methodology (Techniques of Water-Resources Investigations of the United States Gological Survey, Discharge Measurements at Gaging Stations, Book 3, Chapter A8, USGS 1976). All other parameters follow APHA 1980, except dissolved oxygen which should be measured using a meter instead of the Winkler method. All parameters except TSS will be measured on-site. A one-liter TSS sample will be sent to a laboratory for analysis by weight.

The following parameters will be measured quarterly, concurrent with aquatic monitoring:

- total dissolved solids (TDS)
- total alkalinity
- chromium
- copper
- bicarbonate
- carbonate
- sulfate
- sulfide
- aluminum
- arsenic
- barium
- cadmium
- calcium
- lead
- magnesium
- manganese

- phosphate
- nitrate
- specific conductance
- pH
- oil and grease
- potassium
- selenium
- silica
- sodium
- zinc

Quarterly samples of water chemistry parameters will be measured by laboratory analyses of stream samples. These analyses will be performed in accordance with methods specified by Standard Methods for Examination of Water and Wastewater, 15th Edition, 1980; APHA-AWWA-WPCF.

APPENDIX E-4

CULTURAL RESOURCES COMPLIANCE GUIDELINES

INTRODUCTION

It is Bureau of Land Management (BLM) policy to protect cultural resources by avoiding or mitigating any adverse effects that may occur to cultural resources from a Bureau-authorized action. The Environmental Impact Statement (EIS) for the Riley Ridge Project stated that adverse impacts would occur to cultural resources. Therefore BLM, Wyoming State Office Manual 8143 Procedures for Avoidance and/or Mitigation of Effects on Cultural Resources and appropriate Forest Service procedures will be followed for the Riley Ridge Project. The following is a brief overview of work that has been completed and a guide to future work needed for compliance with historic preservation legislation and BLM policy.

BACKGROUND

A cultural resources technical document was prepared in conjunction with the EIS. This document identified all known and recorded historic and prehistoric sites in the Riley Ridge Project area. Written narrative was prepared on the nature and extent of previous human use of the area. Supporting maps and tables showing site and survey locations were prepared. The impacts to cultural resources (as they are presently known) are identified in the EIS. It was recognized that only a small portion of the Riley Ridge Project area has ever been searched for cultural resources and additional surveys will be needed before appropriate mitigation can be developed. Consequently, all previously unsurveyed areas that will be directly affected by the Riley Ridge Project must be surveyed for cultural resources. These surveys must be conducted by qualified personnel in accordance with BLM Manual 8143. In addition, areas that were surveyed prior to 1979 and have inadequate survey reports should be resurveyed.

The Riley Ridge Project as presently planned may comprise a major cumulative effect to historic trails in Wyoming. Project facilities would impact the Overland Trail; the Fort Bridger or main route of the Oregon Trail; the Sublette, Kinney, Lander, Slate Creek, and Hams Fork Cutoffs of the Oregon Trail; the Pony Express variation of the Oregon Trail; the Opal to Pinedale stagecoach road; the Bryan to South Pass City stage route; and the Green River to South Pass City stage route.

Pipelines, transmission lines, railroad routes, and other facilities of the Riley Ridge Project will directly impact historic trails in at least 53 locations and indirectly impact those trails in 65 other localities. Route alternatives, campsites, graves and inscriptions commonly occur in association with historic trails, and therefore direct impacts may occur to historic trails in areas other than the known crossing locations.

The actual effect of these impacts on the historic trails cannot be determined at this time, but impacts to some sites or segments can be expected to be major erosions of the existing resource base. The current historic data base is not sufficient to allow consideration of appropriate mitigation of project impacts to historic period sites. Mitigation plans should be formulated only after professional investigation has determined the nature, frequency, and scientific or cultural significance of resources within potential impact zones. Expertise in the areas of history, oral history, architectural history, and historical archaeology will be required in the inventory, evaluation, and mitigation of historic period cultural resources.

Further historical investigation should, in particular, address two classes of primary sources: first, diaries and other accounts of immigrants pertinent to the segments of historic trails expected to be impacted; and second, interview with long-time residents of the project area. Oral history would be an especially appropriate and necessary research method in the well field area, where descendants of early ranchers are still residents.

Current project schedule projections call for facilities construction to begin in early to mid-1984. Construction will continue until as late as

1992 for some facilities, while for others it will be completed by mid-1987. Well field development is currently underway but will continue until after the year 2000. The majority of the development will be completed by 1993.

It is not necessary that all cultural resource compliance activities be completed before the onset of project construction. However, it is essential that cultural resource survey and mitigation work be initiated in a timely fashion and be properly phased so as to avoid project construction scheduling conflicts.

The applicants, whose actions potentially affect significant cultural resources, are responsible for providing information on construction schedules and impact zones.

FURTHER WORK NEEDED

The following is a general guide to further cultural resource work needed for the Riley Ridge Project.

(1) Class III investigation in areas of certain proposed facilities should begin in earnest in a well-scheduled, phased manner. (In fact, some field work has already taken place, e.g., the West Dry Basin plant site.) Most of the areas to be affected are exterior to the well field (mainly east and south), and only a small portion has been inventoried to date. The probability that significant cultural resources will be discovered is very good in some localities. With construction of some facilities planned for as early as 1984, initiation of cultural compliance activities in those areas is urgent.

(2) Specific field inventory and assessment of any historic trail segments within direct and secondary impact zones of all proposed project facilities should also begin promptly. This includes inspection of numerous trail crossings of rights-of-way exterior to the well field and assessment of the entire route of Lander Cutoff within the well field.

(3) Inventory within the well field, with the exception of the Lander Cutoff route (above), is of lower priority in terms of project construction schedules.

PHASE I: PLANNING

(1) Submittal of specific construction schedules and plans to the agency by the applicants.

(2) Selection of professional cultural resource consultant by applicants.

(3) Submittal of research design and technical plan to agency by consultant, and approval of same by agency (to include SHPO input).

(4) Field staking of proposed facilities by applicants.

PHASE II: INVENTORY AND SIGNIFICANCE EVALUATION

First Priority Inventory

(1) Class III survey of non-well field facilities that have not been adequately inventoried in the past.

(2) Class III survey of specific major facilities within the well field boundaries.

(3) Inventory and assessment of Lander Cutoff within the well field.

(4) Inventory and assessment of trail segments within direct and secondary impact zones of all facilities.

(5) Re-evaluation of known sites within all Riley Ridge direct impact zones for which insufficient National Register significance data exist (may include test excavation, historical records research, etc.).

(6) Evaluation of National Register eligibility of newly recorded sites (may include test excavation, records research, etc.).

(7) Reports to agency by cultural resources consultant; SHPO comment, specifically with regard to significance evaluation.

Second Priority Inventory

(1) Inventory within well field.

(2) Evaluation of National Register eligibility of newly recorded sites (may include test excavation, records research, etc.).

(3) Report(s) to agency by cultural resources consultant; SHPO comment, specifically with regard to significance evaluations.

PHASE III: MITIGATION OF IMPACTS

(1) Mitigation plan submitted to agency by consultant: SHPO comments on plan.

(2) Mitigation plan submitted to Advisory Council (AC) on Historic Preservation by agency; AC comments on effects on significant resources.

(3) Mitigation of impacts to significant resources (avoidance/preservation, data retrieval through excavation, etc.): coordination among agency, applicants, and consultant.

(4) Report to agency by consultant; SHPO review and comment.

The term "consultant" is used in the singular form here. It is recognized, however, that multiple contractors may be working simultaneously, representing both archaeology and history.

A desirable course of action throughout the process of inventory, evaluation, and mitigation would be to fully coordinate all applicants to the extent that cultural resource consultants operate as a single entity rather than independently from one another. Several benefits would be derived. On a general level, communication and feedback among professional archaeologists and historians will increase overall work efficiency and reduce redundancy and duplication of effort. More specifically, a single comprehensive research design could guide all investigations, with data analysis and report writing as a coordinated effort among all participants. A document (or series of documents) resulting from this effort would be a substantial contribution to the prehistory and history of the area. This approach may be contrasted with that which has been taken in the general Riley Ridge area in the past. Literally hundreds of cultural resource investigations have been conducted over the past decade; but no overall research design has prevailed, and our understanding of the archaeology and history remains poor.

Finally, a coordinated research effort offers a major advantage to agency resource managers. National Register significance evaluation should always be conducted within a regional framework. Communication and feedback among cultural resource professionals increase the overall level of understanding about the distribution, general nature, and relative importance of cultural sites, and thus facilitate informed decisions about significance.

1. Project Description

American Quasar Petroleum Company (Quasar), Exxon Company, USA (Exxon), Northwest Pipeline Corporation (Northwest), Mobil Oil Corporation (Mobil), and Williams Exploration Company (Williams) propose to develop, produce, treat, and transport natural gas from new, deep gas well fields in western Wyoming. The planned production is from previously explored but undeveloped reservoirs below 14,000 feet. The project participants are proposing to produce a significant supply of low Btu natural gas and process it to pipeline quality. The gas (called sour gas) contains methane (CH_4), carbon dioxide (CO_2), hydrogen sulfide (H_2S), nitrogen (N_2), helium (He), and other inert gases when extracted from the well fields. The sour gas would be transported by pipelines from the well fields to treatment plants where by-products and impurities would be removed and the natural (sales) gas would be prepared for shipment to available markets by sales gas pipelines. Certain by-products (CO_2, He, and sulfur) are of commercial value if markets can be identified during the life of the project. They may be transported by pipeline, truck, or rail to potential markets. Sulfur dioxide (SO_2) and N_2 would be vented to the atmosphere.

The Riley Ridge Project would consist of the construction, operation, and abandonment of the following components:

-gas well field;

-gathering pipelines for the transportation of sour gas within the gas well field;

-trunk lines for the shipment of sour gas from the terminus of the gas well field gathering systems to the proposed treatment plants;

-gas treatment plants;

-sales gas pipelines for shipment of sweet gas to existing main pipelines;

-facilities for the handling and transportation to proposed markets of by-products (sulfur and CO_2) removed during the treatment process, if markets are developed during the life of the project; and

-ancillary facilities, including access roads and communication and transmission lines.

The Riley Ridge Project area is located in southwestern Wyoming in Sublette, Lincoln, and Sweetwater counties (Map 1 and Maps 1-2 through 1-7 of DEIS). Major physiographic features of the region include the Wyoming Range extending in a north-south direction west of the proposed

project, the Wind River Range east of the project area, and the Green River approximately 13 miles east of the proposed well field. Numerous creeks drain the area and flow eastward to the Green River. Nearby towns include Big Piney, Marbleton, and LaBarge, all of which are located east of the well field along U.S. Highway 189, and Opal and Kemmerer which are located southwest of the southern treatment plant sites. Portions of the proposed well field are located in the Bridger-Teton National Forest and the BLM Rock Springs District, while the balance of the project is located on other public, state, and privately owned land. The Riley Ridge Project area refers to the general region including the Wyoming Range and the Upper Gren River basin, south to Highway 80. The study area refers to the well field, plant sites, and corridors. The area involves approximately 496,000 acres; 159,928 of which are within the well field.

In addition to the Proposed Action, three project siting alternatives were analyzed for the Riley Ridge Project. The Buckhorn, Shute Creek, and Northern Alternatives differ from the Proposed Action primarily in the location of certain plant sites and associated linear facilities. These alternatives change some aspect of the Proposed Action while keeping other aspects unchanged. Component alternatives are options dealing with small changes in the Proposed Action or siting alternatives (e.g., location of a transmission line) designed to respond to specific concerns.

Depending on the decision, there could be one to four processing plants constructed with the project (Table 1). Their locations are presented on maps included with the Draft EIS. The linear and non-linear facilities associated with these plant sites are listed by alternative in Table 2. A number of these facilities or their construction may have the potential to effect endangered wildlife. Figure 1 lists the components or actions that may impact the six listed endangered species.

The removal of surface water from the Green River and its tributaries for the construction and operation of this project is estimated to amount to 3,717 acre-feet for the 30-year project life. The major use is for operation of the treatment plant at the Craven Creek site. Northwest proposes to divert 81 acre-feet per year of surface water from the Green River below Fontenelle Reservoir. This diversion would result in a reduction of less than 0.24 percent during the winter low-flow period. If the Northern Alternative is selected, the plant site at Craven Creek and the water from the Green River for operation would not be required. Water requirements would then be 1,287 acre-feet for the construction and well drilling period only. Water appropriations for the project are unknown at this time.

TABLE 1

Plant Sites By Alternative

Company	Proposed Action	Buckhorn Alternative	Shute Creek Alternative	Northern Alternative
Quasar/Williams	East Dry Basin	Buckhorn	Buckhorn	Buckhorn
Exxon	West Dry Basin	West Dry Basin	Shute Creek	West Dry Basin
Northwest/Mobil	Craven Creek	Craven Creek	Craven Creek	East Dry Basin

TABLE 2 - Land Requirements for the Riley Ridge Project

	Proposed Action		Buckhorn Alternative		Shute Creek Alternative		Northorn Alternative	
	Miles	Acres[1]	Miles	Acres	Miles	Acres	Miles	Acres
Well Fields								
Well Pad Sites	0	1102	0	1102	0	1102	0	1102
Gathering System Pipelines	257.0	2109	257.5	2115	257.5	2115	257.5	2115
Access Roads	297.5	1560	297.5	1560	297.5	1560	297.5	1560
Plant Sites								
Processing Plants	0	2560	0	2560	0	1920	0	2560
Sulfur Loadout	0	240	0	240	0	240	0	240
Corridors								
Underground Pipelines								
Sour Gas Trunkline	55.5	507	87.5	810	124.0	1252	46.0	421
CO_2	211.0	1951	192.0	1792	158.0	1385	258.0	2415
Sales Gas	186.0	1717	167.0	1563	133.0	1151	191.5	1750
Water	12.0	87	12.0	87	12.0	87	---	---
Above Ground Pipelines								
Molten Sulfur	58.0	528	69.0	628	72.5	660	71.5	651
Transmission Lines	155.5[2]	1182	170.5[2]	1228	176.5[2]	1261	155.5[2]	1018
Access Roads	9.0	48	17.5	73	42.0	222	21.5	97
Railroad Sulfur Transport	7.0	85	7.0	85	7.0	85	---	---
Component Options								
Railroad Sulfur Transport	91.5	1109	91.5	1109	8.5	103	91.5	1109
Construction Camps	0	960	0	640	0	640	0	960
Transmission Lines (UP&L)	95.0	1152	97.5	1182	104.0	1261	80.0	970
Transmission Lines (BLM)	99.5	1206	102.0	1236	103.0	1248	82.0	994

[1]Construction Right-of-Way

[2]This includes the miles of 69kV transmission line that will parallel the sulfur pipeline.

Figure Riley Ridge Project Components or Actions that Could Affect Endangered Species.

PROJECT COMPONENTS or ACTIONS \ ENDANGERED SPECIES	Black-Footed Ferret	Bald Eagle	Whooping Crane	Peregrine Falcon	Colorado Squawfish	Humpback Chub
Plant Sites						
East Dry Basin	●					
West Dry Basin	●					
Big Mesa						
Buckhorn						
Craven Creek	●			●	●	
Shute Creek	●					
Sulfur Loadout Site	●					
Underground Pipelines	●					
Above Ground Pipelines *	●	●*	●*	●*		
Access Roads	●	●				
Railroad	●	●				
Transmission Lines	●	●	●	●		
Surface Water Removal				●	●	

*Potential impacts from above ground sulfur pipeline are associated with the parallel transmission line.

2. Listed Species Which May Occur In the Area

Initially the Fish and Wildlife Service listed four endangered species which may occur in the project area (letter dated November 9, 1981):

Whooping Crane (*Grus americana*)
Bald Eagle (*Haliaeetus leucocephalus*)
Black-footed Ferret (*Mustela nigripes*)
Peregrine Falcon (*Falco peregrinus*)

Subsequently, the Fish and Wildlife Service amended the list to include two additional endangered species (letter dated May 16, 1983):

Colorado Squawfish (*Ptychocheilus lucius*)
Humpback Chub (*Gila cypha*)

The Forest Service Manual (FSM 2670.5) defines a "may affect" situation as an action which has an apparent direct or indirect effect, positive or negative, on the conservation and recovery of a listed species. Such actions include, but are not limited to:

a) Any action which will directly benefit a listed species.

b) Any action which will directly alter, modify, or destroy critical habitat or essential habitat, or render occupied habitat unsuitable for use by the species, or otherwise affect productivity, survival, or mortality.

c) Any action which will directly result in the taking of a listed species as defined in 50 CFR, part 17, subpart A, section 17.3.

d) Any action involving the disposal of land which is occupied or suitable unoccupied habitat.

This biological assessment finds a "may affect" situation for bald eagle, and whooping crane on non-Federal lands based on items b, c, and d above.

Measures required in the lessees' and applicants' operating plans and contracts should result in "no affect" on Federal lands for these species. The assessment further determines a "may affect" situation for the black-footed ferret, pending results of competent surveys a year prior to construction.

No breeding pairs of peregrine falcons are known to occur in the project area (R. Oakleaf pers. comm.). Peregrines have been observed during migration on the Seedskadee National Wildlife Refuge on the Green River.

This biological assessment finds a "no affect" situation for the Colorado squawfish and humpback chub because the depletion of water from the Colorado River system for this project is considered insignificant.

3. Population and Habitat Conditions

Whooping Crane

The cross-foster parent experiment at Gray's Lake National Wildlife Refuge, Idaho, is an attempt to establish a second wild population of whooping cranes. Whooping crane eggs are placed in greater sandhill crane nests to be hatched and the young raised by sandhill crane foster parents. The whooping cranes have adopted the migration routes of the sandhill cranes and migrate through the stop over in southwest Wyoming (R. Drewien pers. comm.).

The Gray's Lake population of 17 whooping cranes (10 subadults and 7 young) migrated south to New Mexico during the fall of 1982. One young crane flew into a power transmission line and was killed in New Mexico in the spring of 1983 (E. Bizeau pers. comm.).

Approximately 10-12 birds migrate through southwest Wyoming during the spring and fall. This includes cranes that summer in the area (E. Bizeau pers. comm.). The number of reported sightings of whooping cranes in the project area has increased during 1980-1982. Four birds summered in or near the project area during 1982; one on Fontenelle Creek; one on Thomas Fork Creek west of the project area; and two north of the project area in the Beaver Creek-Horse Creek area. No known nesting or pair-bonding has occurred among Gray's Lake whooping cranes. Several birds, however, are reaching maturity and may mate and nest in the future.

Habitats used by whooping cranes include riparian areas consisting of grasses, sedges, and willows; irrigated native and introduced grass meadows; and other wet meadows (Whooping Crane Recovery Team 1980). Such areas occur along the Green and Hams Fork Rivers, Fontenelle, LaBarge, South Piney, Middle Piney and North Piney and Meadow Canyon Creeks in the project area. They contain abundant food for cranes and provide seclusion from humans at key seasons.

Bald Eagle

Bald eagles generally occur in the Riley Ridge Project area during October-May. At this time eagles congregate near larger bodies of water, mainly the Green River, Fontenelle Reservoir, and Seedskadee National Wildlife Refuge. Concentrations of bald eagles observed in the project area occur along the Green River below Fontenelle Reservoir and about 5 miles south of Big Piney, Wyoming; however, they also occur along many of the Green River tributaries.

The number of bald eagles wintering in the project area has increased steadily from 21 in January, 1980, to 43 in January, 1983 (National Wildlife Federation Midwinter Bald Eagle Surveys).

The 1983 Mid-winter Bald Eagle Survey reports that 43 bald eagles wintered in the project area in January. Of this count, 33 eagles were on or near the Seedskadee National Wildlife Refuge and Fontenelle Reservoir. Nine bald eagles were recorded during the survey from the area near the confluence of the New Fork and Green Rivers on the Fontenelle Reservoir along the Gren River and its tributaries. One eagle was counted on the Big Sandy River near Farson, Wyoming. The mid-winter survey on the refuge was also the highest count (33) of bald eagles in the vicinity of the refuge for the 1982-1983 winter (J. Rodriques pers. comm.).

In the winter of 1981-1982 a high of 44 eagles occurred in February, while 29 eagles were recorded in January during the midwinter survey on the refuge (J. Rodriquez pers. comm.). Seven bald eagles were recorded during the 1982 midwinter survey from the area near the confluence of the New Fork and Green Rivers to the Fontenelle Reservoir along the Green River and its tributaries.

Balsam poplar or cottonwood (Populus balsamifera) along the Green River provide roost sites during winter. Cottonwoods are also used as perch sites near foraging areas of open water (Fontenelle Reservoir, Green River and tributaries) before freeze up in late fall and after the ice goes out in early spring. During these times, bald eagles forage on fish, waterfowl, and carrion. After the larger bodies of water have frozen, eagles forage primarily upon road kills, winter kills, and other carrion. Eagles are seen feeding on road killed animals along major highways and roads in the project area, including highways 189, 351, 350, and Meadow Canyon, LaBarge Creek and Calpet county roads.

In spring, 1983, a pair of adult bald eagles nested in a cottonwood approximately four miles south of Big Piney along the Green River. This nest is the first bald eagle nest on the Green River that has been recorded and mapped (R. Oakleaf pers. comm.). The past nesting records from the 1940's near Big Piney and near the confluence of the New Fork River and Green River (R. Oakleaf pers. comm.) and possibly along North Piney Creek, north of the project area (Johnson and Hinschberger unpubl. data).

Colorado Squawfish and Humpback Chub

The Colorado squawfish and humpback chub are found exclusively in the large river system of the Colorado River Basin. They both can be found in clear water but prefer turbid warm waters in excess of 68° F.

Preferred habitat for the squawfish changes with season and water level. Backwaters are preferred during seasons of high water. A shift is made to eddies when water levels are low. The specialized habitat of this fish is the silty canyon waters of the lower Green River and the Colorado River. The Colorado squawfish once had a wide distribution in the Colorado River and its major tributaries. The squawfish has disappeared in the lower basin of the river. The habitat changes caused by dam construction, water diversions, and channel changes have resulted in the decline of this species. Fluctuations in water temperature and flow,

decreases in turbidity, increases in salinity, and loss of spawning habitat are examples of these changes. Competition from introduced fish species has also been a factor in their decline (Forest Service 1980).

The humpback chub is restricted to the small eddies associated with swift water canyons commonly in depths near or greater than 20 feet. Humpback chub are found only sporadically in the canyon areas of the large rivers of the Colorado River Basin. Though they were probably never abundant, current low population levels are attributed to river habitat loss and modification such as decrease in water temperature due to dams (Forest Service 1980).

Black-footed Ferret

Sixteen positive and/or probable sightings or evidence of black-footed ferrets have been reported in the vicinity of the project area since 1972 (Clark 1980, Clark and Campbell 1981) (Map 1-5 of Wildlife Technical Report). A skull of a black-footed ferret was discovered in 1978 on a prairie dog town approximately 24 miles south of Kemmerer, Wyoming (Martin and Schroeder 1978). Thus, there exists a reasonable likelihood that black-footed ferrets could occur in the project area.

Historically, the geographic range of the black-footed ferret included most of the Great Plains grasslands as well as semiarid grasslands and sagebrush steppes of the Intermountain West (Hall and Kelson 1959, Hillman and Clark 1980). "Key habitat" for the black-footed ferret basically translates to adequate abundance and distribution of prairie dogs (Cynomys spp.), its main prey (Hillman and Clark 1980).

Prairie dog colonies in the study area are most common along rivers, streams, other drainages with wide valleys, and in disturbed areas where the soil is less compacted and grasses and forbs dominate the vegetation (e.g., along pipelines, hay fields, etc.). Natural vegetation associated with towns include shrubs (e.g., Gardners saltbush, big sagebrush, hopsage, spiny sagebrush, shadscale, winterfat, horsebrush, rabbitbush) and grasses (e.g., squirreltail, Indian ricegrass, thick-spike wheatgrass). Priarie dogs are most common in dense stands of tall shrubs (i.e., sagebrush flats, greasewood) where visibility for predators is limited. They occasionally occur in areas with widely scattered tall sagebrush and greasewood.

White-tailed prairie dog activity was not reported within the well field primarily because of marginal habitat conditions.

Prairie dog towns are common east of the well field. One-hundred fifty-seven towns over 10 acres in size were mapped within corridors and on support facility areas with a total of approximately 28,500 acres of towns. Many of these towns are large enough to support ferrets (i.e., 36 towns from 10 to 50 acres, 30 towns from 50 to 100 acres, 68 towns from 100 to 500 acres, 10 towns from 500 to 1,000 acres, 3 towns over 1,000 acres).

Several priarie dog concentration areas were found along the corridors and support facility areas, including:

-R111W T29N - 8 colonies, several large colonies along the Green River east of Big Piney;

-R112W T26N - 10 colonies, just west of LaBarge;

-R112W T23N to R110W T20N - approximately 40 colonies, in the vicinity of Shute Creek and Craven Creek plant sites;

-R108W T20N - 12 colonies, area east of Shute Creek plant site; and

-Areas west of Rock Springs, approximately 5 colonies.

4. Consequence Analysis

Whooping Crane

The consequences of the proposed land use impacts upon the quality of the habitat in the proposed land use areas vary depending upon the type, timing, and duration of the land use. Temporary loss of potential crane habitat in the project area due to underground pipeline construction should have no effect upon whooping cranes. The relatively small amount of temporarily disturbed area (500 acres) of the total crane habitat available and the short term and reversible nature of pipeline disturbance (if proper reclamation procedures are followed) indicate no effect from alteration per se. However, underground pipeline construction during the time of use of the areas by whooping cranes could pose a seasonal conflict on the quality of the cover and security habitat for the cranes. Sustained human activity associated with pipeline construction during periods of use by whooping cranes in these habitats would disturb use of these areas of feeding.

Above-ground land uses such as transmission lines across riparian and irrigated pasture land could have a long-term negative effect on the whooping crane. Construction activities related to transmission lines in these habitats during the time of use by whooping cranes can have a short-term negative effect on quality of habitat and preclude its use by cranes. The important negative effect of transmission lines, however, is increased potential for loss of individual whooping cranes due to collisions with the transmission lines. Whooping cranes can be especially susceptible to collision when these lines cross large riparian and pasture/hayfield areas and during periods of poor visibility due to poor light and weather.

Bald Eagle

Foggy weather occurs frequently in the vicinity of Big Piney during winter mornings and especially along the Green River. Bald eagles, while foraging or just flying over the Green River, could be exposed to increased collision hazards and mortality from the two proposed transmission line crossing of the Green River. This hazard can be greatly magnified during periods of strong winds, poor light or foggy conditions. Bald eagles can also be exposed to greater collision hazards and mortality if these same transmission lines cross other riparian areas.

Transmission lines would also cross LaBarge and Fontenelle Creeks. These crossings would occur near the lower reaches of these Green River tributaries. Eagles also periodically forage upstream along these creeks.

The bald eagle nest site is located approximately 0.75 mile east of the component alternative for sulfur transport from West Dry Basin plant site to Stauffer Chemical Plant by railroad (RR-WDB). It is also located about 4 miles north of the proposed Green River crossing for linear facilities to the Buckhorn Plant site under all alternatives except the Proposed Action. These linear facilities include about ground and underground pipelines and two different size transmission lines. One line is a 60 kV line associated with the molten sulfur pipeline; the other line will be between 138 and 345 kV to power the Buckhorn plant. Young eaglets, recently fledged from nests in the vicinity of these transmission lines, would be susceptible to striking these powerlines and mortally wounding themselves.

Because carrion is a major food item for eagles, increased traffic and resulting road kills, especially in close proximity to roosting and nest sites, would also increase the chance of vehicles striking and killing bald eagles and other raptors feeding on roadside carrion. One bald eagle was killed by a vehicle in the winter of 1981-82 along Highway 189 just north of the project area (B. Johnson pers. comm.).

Counts of big game road kills on Highway 189 between Big Piney and Fontenelle Reservoir were recorded by the Wyoming Highway Department for the winter of 1981-82. Assuming a direct, linear relationship between average annual traffic volume and road kills, 1986 baseline (without the project) mortality would be 125 mule deer and 18 pronghorn. With the Proposed Action, estimated additional mortality would be 90 mule deer and 13 pronghorn during 1986 (construction), a 72 percent increase over baseline. This represents the peak impacts, though impacts of this magnitude would occur throughout the construction phase. Traffic volumes on Highway 189 would be lower during operation than during construction. An estimated 30 mule deer and 5 pronghorn would be killed by project-related traffic during operation each year on Highway 189 between Big Piney and Fontenelle Reservoir.

This section of Highway 189 would represent the most heavily impacted road section within the project area based on projected increases in traffic volume and the occurrence of big game winter range. This section of Highway 189 parallels the Green River for its entire length and is only 1.5 miles from the river at its most distant point.

Colorado Squawfish and Humpback Chub

Cumulatively, industrial water diversions from the Gren River and its tributaries could affect the recovery of the Colorado squawfish and humpback chub (F. Bolwahnn pers. comm.). Removal of 81 acre-feet per year is insignificant compared to removal of 25,000 acre-feet per year for the Big Sandy Salinity Project and 22,500 acre-feet per year for the Chevron Chemical Phosphate Project. However, because the average annual

evaporation losses from the Fontenelle and Flaming Gorge Reservoirs are 15,000 and 75,000 acre-feet respectively (L. Morrison pers. comm.), the Riley Ridge Project water depletion from the Colorado River system is considered insignificant and, by itself, should have "no effect" on these two endangered fish species.

Black-footed Ferret

Black-footed ferret probably breed during March and April, as evidenced by observed changes in behavioral patterns (T. Clark, pers. comm.) and by the capture/recovery of female ferrets in various stages of the reproductive cycle (Henderson et al. 1974). With a 42-day gestation period, parturition occurs in May and June. The young remain underground and dependent upon the female for food until July. During August, the female begins to separate the litter (average size is three to four) into different burrows. As the young approach adult size in September, dispersal occurs. The adults and some of the young may remain in the prairie dog town during the winter. Apparently small individual "activity areas" are set up, the number and size of which probably vary depending upon the availability of prey. These "activity areas" seem to change or break down in the spring with the onset of the breeding season.

Further details concerning the life cycle and biology of the black-footed ferret are documented by Henderson et al. (1974) and Hillman and Clark (1980). In addition, the biology of the primary prey species, the white-tailed prairie dog (Cynomys leucurus), has been summarized by Clark et al. (1971).

Construction activities (such as the building and improvement of roads, drill pads, plant sites, railroads, sulfur loadout site and pipelines) result in the removal of vegetation and subsequent loss of habitat. Dust and noise associated with construction, maintenance, and facility use could render additional habitat unsuitable. Potential habitat loss will increase exponentially as the network of roads and facilities becomes more dense.

Construction activities (such as hole/trench digging associated with pipelines, road/pad construction, transmission lines, etc.) could result in direct ferret mortality due to burrow collapse and crushing. During the period April 15 through July 31, young ferrets may be particularly susceptible to this type of mortality.

Increased vehicular traffic on existing roads or on new roads will increase the probability of additional ferret road kills. Road-killed ferrets discovered in South Dakota and near Meeteetse suggest that this may be a significant source of mortality.

Increased human access to the area could result in increased ferret mortality through intentional/unintentional shooting, domestic dog predation, poisoning, incidental trapping, disease introduction, or a variety of additional unforeseen causes.

Spills of toxic chemicals, oil/gas leaks, or the release of treated water high in mineral content may reduce the availability of fresh water and cause ferret mortality through ingestion or secondary poisoning. Excessive oil on an individual's fur may reduce its insulating properties to the extent that winter survival is jeopardized.

5. Stipulations

Appendix B of the Draft Environmental Impact Statement (DEIS) for the Riley Ridge Project contains required Federal measures and applicants' standard operating procedures designed to reduce environmental impacts. Many of these required measures and operating procedures along with the committed mitigation measures listed in the DEIS are designed to reduce impacts to fisheries and wildlife. In addition, the following measures will be required on Federal lands as pertinent to further minimize impacts to listed species. These measures will be part of the lessees' and applicants' operating plans and contracts.

Whooping Crane/Bald Eagle

Construction of facilities (linear and nonlinear) in habitats utilized by whooping cranes and sandhill cranes (riparian, pasture/hayfields, and wet meadows) should be timed so that it does not coincide with areas of historic use by whooping cranes during migration stopover periods (Spring--May-June 10; fall--September-October 10).

Potential roost and nest trees (cottonwoods and poplars) will be left in riparian areas (in particular the Green River) traversed by pipelines and transmission lines whenever feasible. Should bald eagle nests be encountered during the construction phase for these activities, such nests will not be removed and will be avoided through routing changes or construction postponement until after the nesting season.

Increase visibility of transmission lines or powerlines where they cross riparian areas of the Green River, Hams Fork, Slate, Sheep, Fontenelle, and LaBarge Creeks (see Map 1-5). Some visual devices such as balls or insulation tubing will be placed on the wires where these lines cross geomorphic unit 12 and soil association A areas (Soil Unit 101 - see draft corridor map for soils, geomorphology, and vegetation). Increasing the visibility of these lines should reduce the collision hazards to bald eagles, whooping cranes, and other birds during foggy weather or periods of poor light.

At riparian crossings mentioned above where the proposed transmission lines and the existing lines (69kV) are in adjacent or shared corridors (e.g., BLM power supply alternative), all wires will be positioned on a flat horizontal configuration. This may require raising the existing lines, lowering the proposed lines, or some combination of both so that all wires are at the same elevation and in a horizontal congruent plane. This should further reduce the collision hazards to endangered bird species as well as other birds.

☆U.S. GOVERNMENT PRINTING OFFICE:1983—776-061 / 1038

The General Measures Section of Appendix B in the DEIS requires that for transmission lines or powerlines, the applicants meet all requirements contained in the current Suggested Practices for Raptor Protection on Powerlines.

Increased traffic and resulting road kills would also increase the chance of vehicles striking and killing bald eagles and other raptors feeding on roadside carrion. To reduce this chance, road kills on paved highways should be removed daily from the surface of highways to the edge of the right-of-way in the project area, in particularly U.S. Highway 189 from LaBarge to Big Piney and the Calpet road, near winter concentration areas of bald eagles.

Black-footed Ferret

Prior to any construction/earth moving activities on sites with prairie dogs, a competent survey for black-footed ferrets will be conducted. The survey techniques will, at a minimum, follow the USDI Fish and Wildlife Service guidelines current at the time. New ferret survey techniques emerging from the studies at Meeteetse, Wyoming (T. Clark and associates) or elsewhere also will be incorporated.

Until surveys prove otherwise, this assessment finds a "possibly may affect" situation for the black-footed ferret.

If no signs of black-footed ferrets are found in the project area, construction can be permitted. If evidence of ferrets are found, consultation will be initiated.

REFERENCES

Bizeau, E., Assistant Leader, Cooperative Wildlife Research Unit, University of Idaho. 1983. Personal communication with Mark Hinschberger, Forest Service.

Bolwahnn, F., Biologist, Fish and Wildlife Service, Salt Lake City, Utah. 1983. Personal communication with Mark Hinschberger, Forest Service.

Clark, T. W. 1980. A listing of reports on black-footed ferrets in Wyoming (1851-1977). NW Science 54(1):47-54.

Clark, T. W., R. S. Hoffman, and C. F. Nadler. 1971. Cynomys lecurus. Mamm. Species. 127: 4pp.

Clark, T. W. and T. M. Campbell. 1981. Additional black-footed ferret (Mustela nigripes) reports from Wyoming.

Drewien, R., Idaho Cooperative Wildlife Research Unit. 1983. Personal communication with John Weaver, Forest Service.

Forest Service. 1980. Threatened and Endangered Animal and Plant Species. U.S. Department of Agriculture. U.S. Government Printing Office. Washington, D.C.

Hall, E. R. and K. Kelson. 1959. The mammals of North America. Ronald Press, New York. 1083 pp.

Henderson, F. R., P. F. Springer, and R. Adrian. 1974. The Black-footed Ferret in South Dakota. South Dakota Department of Game, Fish and Parks, Pierre. 36 pp.

Hillman, C. N. and T. W. Clark. 1980. Mustela nigripes. Mamm. Species 126: 3 pp.

Johnson, B., Biologist, Wyoming Game and Fish Department, Big Piney. 1983. Personal communication with Mark Hinschberger, Forest Service.

Martin, S. J. and M. H. Schroeder. 1978. Black-footed ferret surveys on seven coal occurrence areas in southwestern and south central Wyoming. USDI, Fish and Wildlife Service Report. Fort Collins, CO. 37 pp.

Morrison, Lee. Bureau of Reclamation. 1983. Personal communication with Mark Hinschberger, Forest Service.

Oakleaf, R., Biologist, Wyoming Game and Fish Department, Lander. 1983. Personal communication with Mark Hinschberger, Forest Service.

Rodriquez, Jr., J.B., Manager, Seedskadee National Wildlife Refuge. 1983. Personal communication with Mark Hinschberger, Forest Service.

Whooping Crane Recovery Team. 1980. Whooping Crane Recovery Plan.

Bureau of Land Management
Library
Bldg. 50, Denver Federal Center
Denver CO 80225

BLM Library
D-553A, Building 50
Denver Federal Center
P. O. Box 25047
Denver, CO 80225-0047

R'S CARD

3b

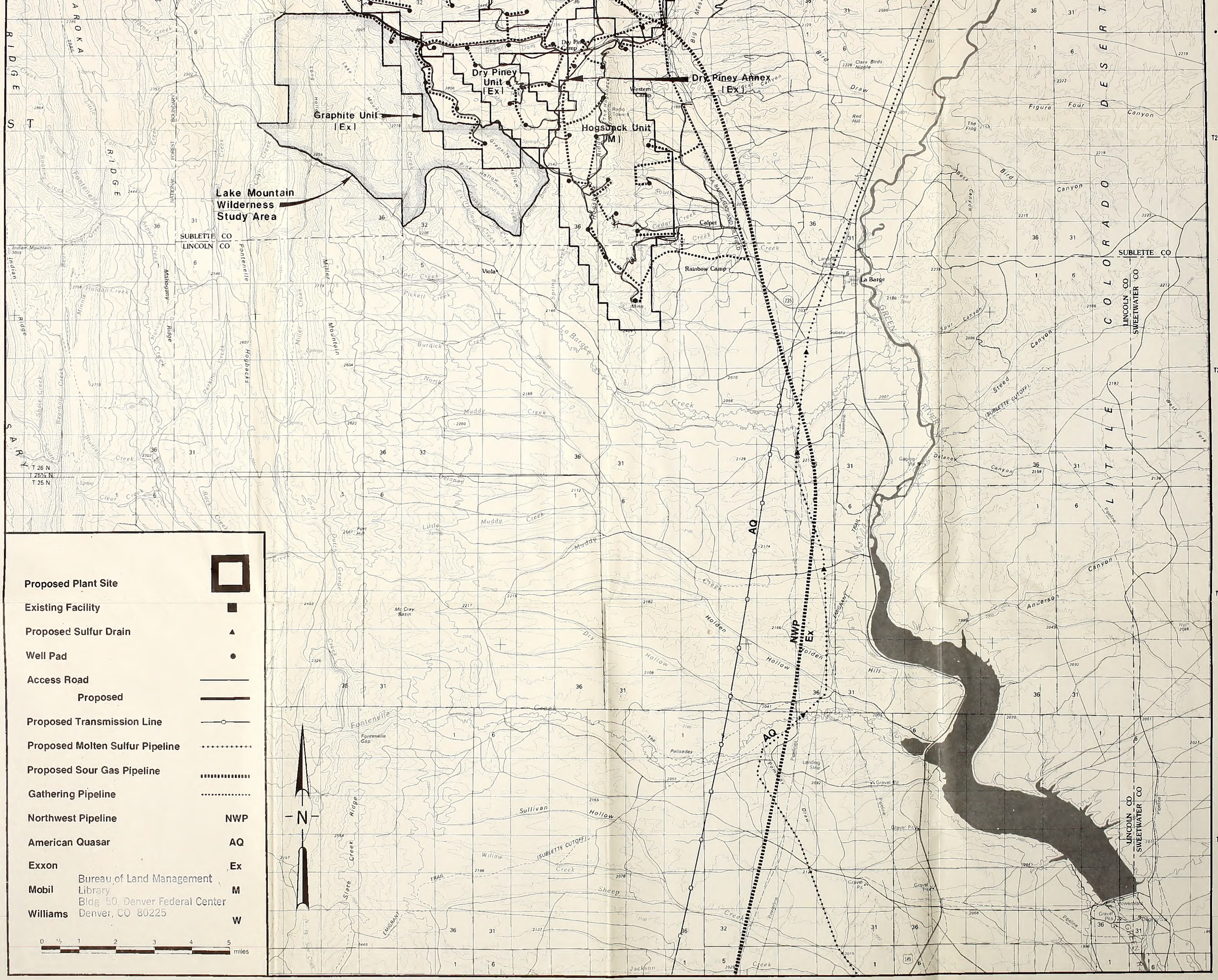
l impact
Riley

	OFFICE	DATE RETURNED
ver	D-470	6-23-89

(Continued on reverse)

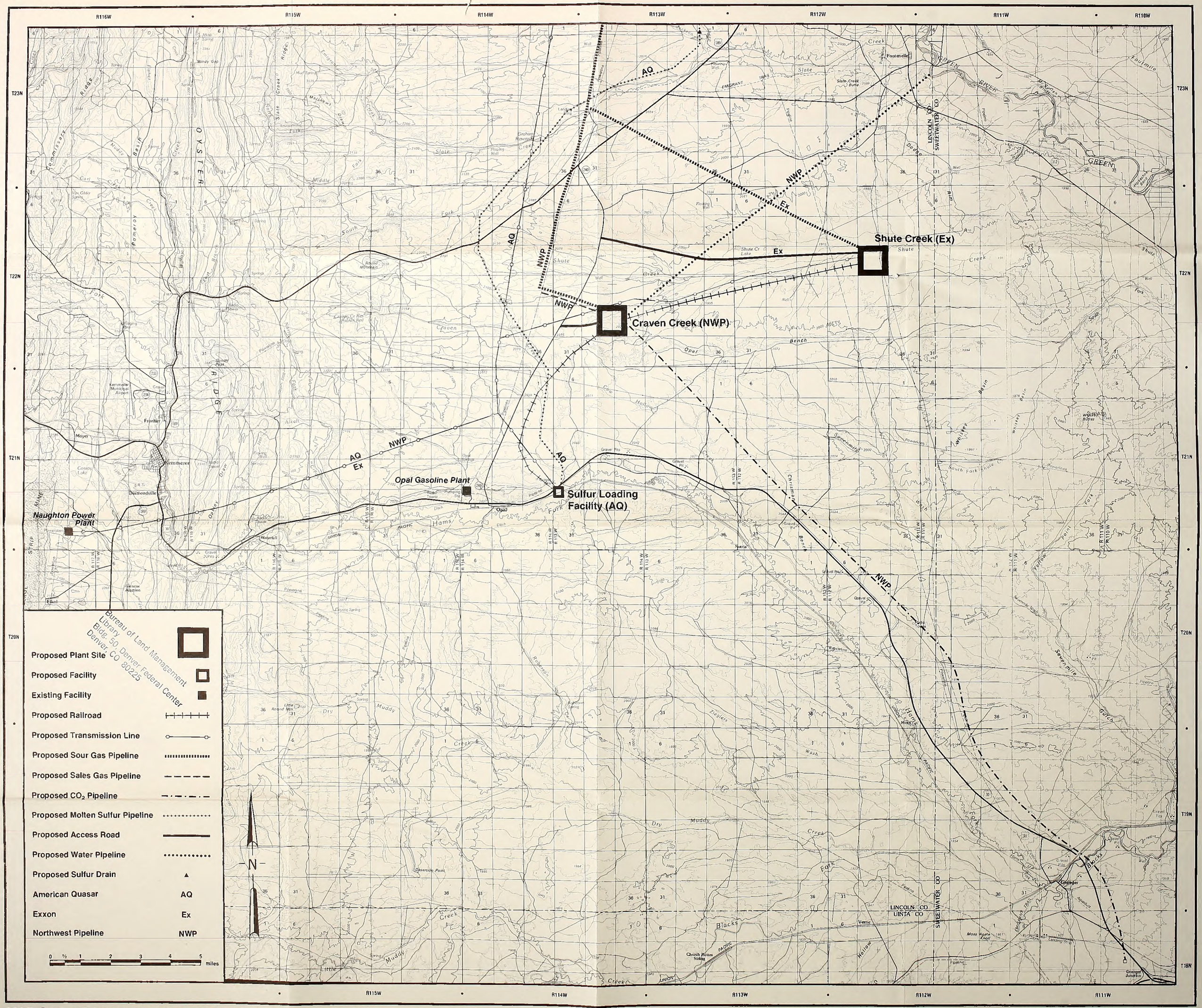
Bureau of Land Management
Library
Bldg. 50, Denver Federal Center
Denver, CO 80225

R116W
R115W
R114W
R113W
R112W
R111W
T31N
T30N
T29N
T28N
T27N
North Riley Ridge Unit (AQ)
Williams Maintenance Base
Well Field Boundary
Sawmill Area (AQ & W)
Darby Mountain Unit (AQ)
Riley Ridge Unit (AQ)
East Dry Basin (AQ)
Lake Ridge Unit (Ex)
Trip Top Unit (M)
Fogarty Creek Unit (Ex)
Big Piney Compressor Station
Dry Piney Unit (Ex)
Dry Piney Annex (Ex)
Graphite Unit (Ex)
Hogsback Unit (M)
Lake Mountain Wilderness Study Area
LINCOLN CO
SUBLETTE CO
Marbleton
Big Piney
GREEN RIVER
DRY BASIN
OIL AND GAS FIELD
LANDER CUTOFF
EMIGRANT TRAIL
JEEP TRAIL
ABSAROKA RIDGE
RADO DESERT



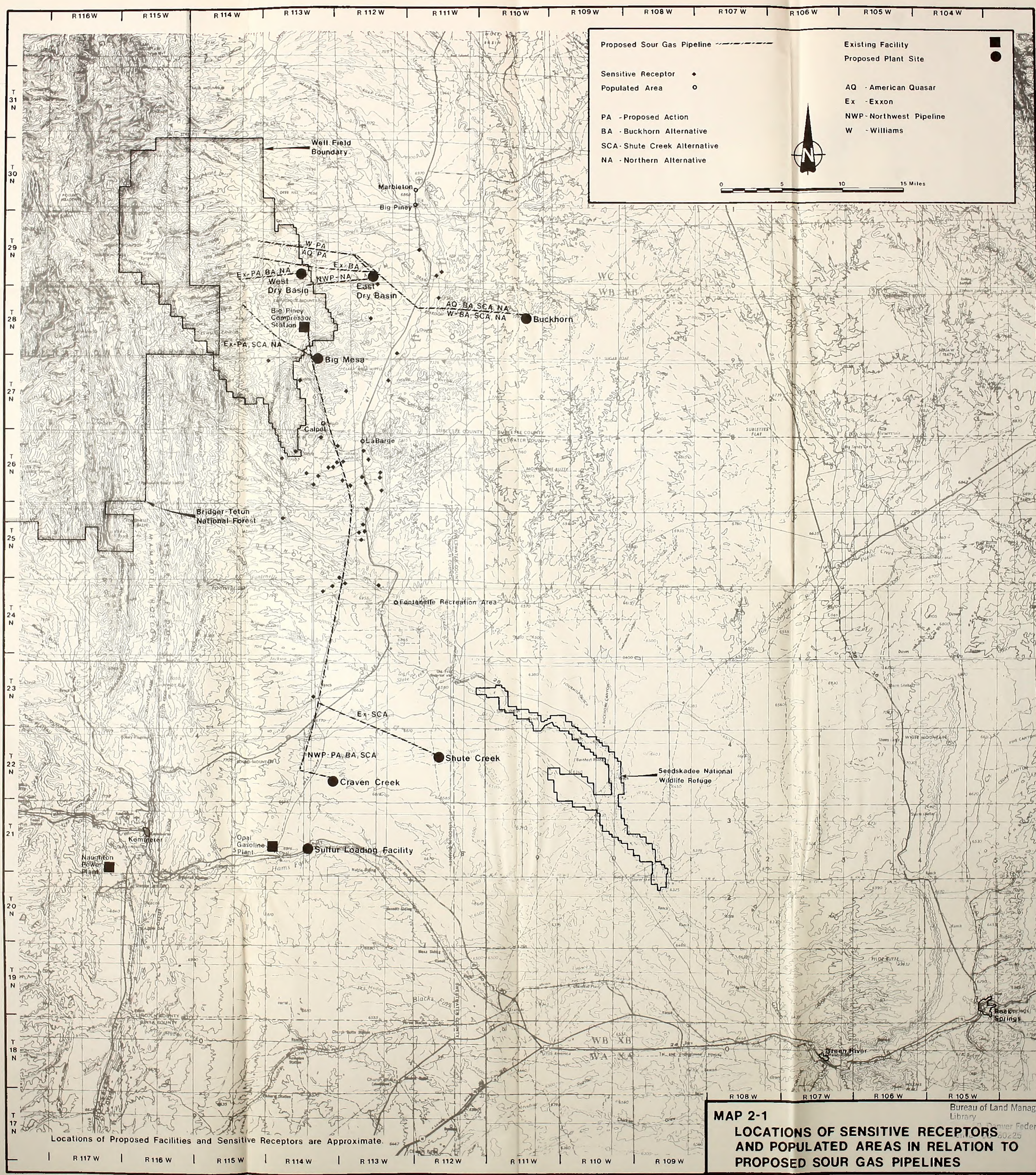
Bureau of Land Management
Library
Bldg. 50 Denver Federal Center
Denver, CO 80225

MAP S-1 PREFERRED ALTERNATIVE (North ½)



Bureau of Land Management
Library, 50 Denver Federal Center
Bldg. 50, Denver, CO 80225

MAP S-2 PREFERRED ALTERNATIVE (South ½)



MAP 2-1

LOCATIONS OF SENSITIVE RECEPTORS AND POPULATED AREAS IN RELATION TO PROPOSED SOUR GAS PIPELINES

Bureau of Land Management
Library
Denver Federal Center

BLM-YA-ES-84-002-1327